38 NEW PRODUCTS: PAGE 193 • 20 PRODUCT REVIEWS: PAGE 162

MACWORLD

The Macintosh® Magazine

June 1991 $3.95 Canada $4.95



SECURITY

How to protect your Mac

PLUS

• OPTICAL DRIVES • HAND-HELD SCANNERS • ALL ABOUT MIDI • FLATBED SCANNERS

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

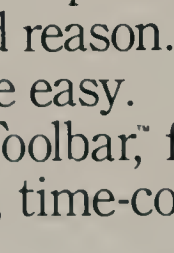
System 7.0 support

Sincerely, Allen Pier

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

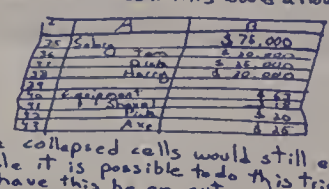
Drawing Tools



9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

"Collapsing Cells": Collapsing cells would be to a spreadsheet what outlining is to a word processor. A "Collapse" command would allow a number of worksheet cells to essentially disappear and become part of a "header" cell. This would allow the data which underlies a displayed number to be kept with that number, but not (necessarily) shown.



For example, this would collapse to this.

The collapsed cells would still exist, but would not be displayed or printed unless an "Expand" command were used. While it is possible to do this trick by setting row heights to zero, it would be slick to have this be an automatic feature.

Sincerely, John Broadbent, Golden Valley, Minn.

Microsoft
Making it all make sense

New Microsoft Excel

of an exhaustive cor



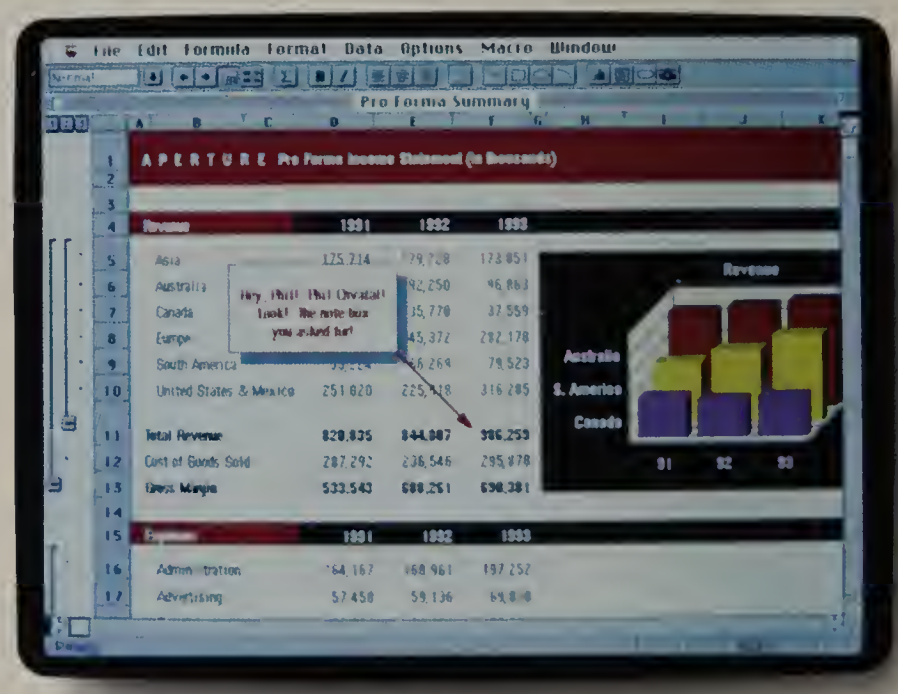
Betsy Mill put it all in perspective when she wrote to us, "I love [Microsoft] Excel as much as my microwave oven but no love is perfect."

Well, Betsy, get a load of this. We think new Microsoft® Excel version 3.0 is the closest thing to perfection ever seen in a spreadsheet for the Mac.® For one good reason.

Power made easy.

The new Toolbar,™ for instance, reduces common, time-consuming tasks down to one step.

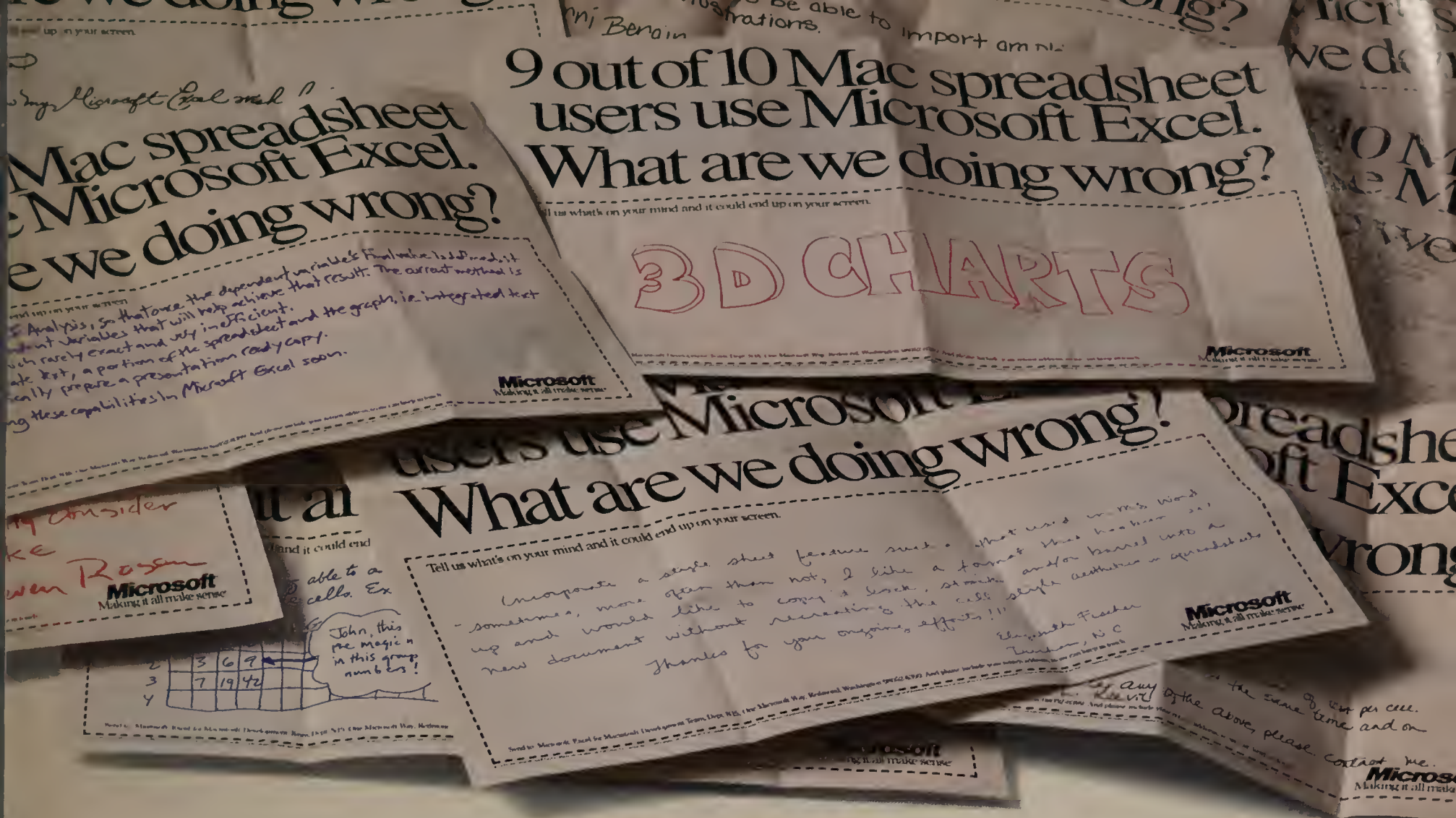
Highlight a row or column of numbers, hit the Σ button (that's Autosum™), and *voilà* – it all adds up.



Yes, Paul, a single button now lets you access 68 chart types, 24 of which are 3-D. You can incorporate these right into your worksheet, along with text and data. And notice the outlining feature on the left? Go nuts.

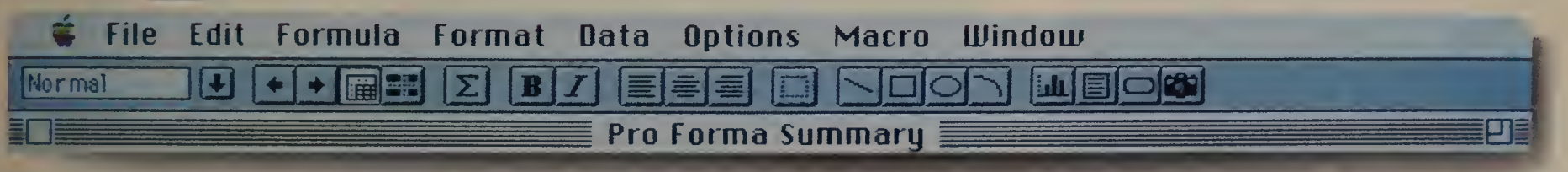
Do quick, push-button formatting. Use outlining features to collapse

**Plus shipping and handling and applicable sales tax. If you are a registered user of Microsoft Excel, watch your mailbox for an update coupon. Offer good only in the 50 United States. In the 50 United States, call (800) 541 1261, Dept. Q83. For information outside the United States, call (206) 882 8088. Microsoft Corporation. Mac is a registered trademark of Apple Computer, Inc.*



version 3.0. The result

respondence course.



Take a look at the new Toolbar. In one step, you can now access style sheets, outlining features, Autosum, formatting options, drawing tools, charts of all kinds and macros. Go to town.

or expand worksheets without having to create multiple files.

As for charting, we took our cue from Paul Woods, who began his letter with the salutation, "Charts, charts, charts!" Hey, Paul – check out the picture and caption for the full scoop.

Did we mention that you can consolidate up to 255 worksheets at a time, regardless of format?

Or the Goal Seek feature, which lets you put in the total you want and works backwards from there to fill in the variable you need?

Or the fact that this is the first System 7.0 application available?

Plus, you can update to version 3.0 for $129. If you acquired your current version of Microsoft Excel on or after 12/7/90, the upgrade is only $50.* Call (800) 541-1261, Department Q83, to find out more.

By the way, Bryan Larson: we said hi to Bill for you. He sends his regards.

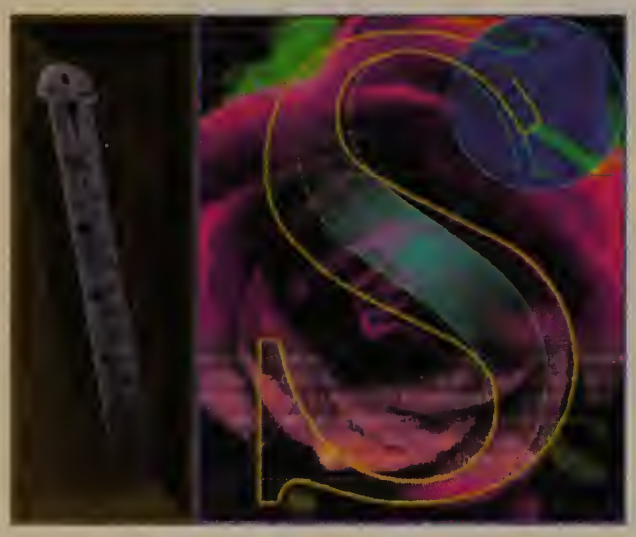
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CONTENTS



On the Cover
How safe is your Mac? We explore a wide range of security hardware and software to help ward off snoops, thieves, and accidents, page 122. (Photo by Paul Franz-Moore.)



In News
Visual scaling for digital fonts—an old tradition meets a new technology, page 99.

DEPARTMENTS

How to Contact Macworld 12

MacBulletin 17

Commentary/Jerry Borrell 23
The trial and error of global publishing.

Letters 35

Art Beat 63
By Cathy Abes

The Iconoclast 69
By Steven Levy The forces that killed Lotus Marketplace.

Conspicuous Consumer 91
By Deborah Branscum Products and resources for Macintosh users with disabilities.

News 99
By Dan Littman and Tom Moran

New Products 193

How To/Quick Tips 203
By Lon Poole

How To/Getting Started with Resource Editing 219
By Jim Heid

How To/Insights on MacProject II 231
By Peggy J. Day

Updates 237

Where to Buy 245

Best-Sellers 290





FEATURES

Solving Your Security Worries 122

By Robert C. Eckhardt From disk lockers to file encryptors, here are the best ways to protect the Mac from thieves, viruses, and prying eyes.

Affordable Color Scanning 130

By Joe Matazzoni We evaluate 15 low- to midpriced color flatbed scanners to find out which ones give you the best image quality for the lowest price.

Optical Outlook 138

By Charles Seiter Looking for relief from your mass-storage blues? Improved performance and plummeting prices could make this year's erasable optical drives the best option.

First Steps in the Sequence 146

By David Pogue It's not that hard to make music with the Mac. Our MIDI primer can help you orchestrate a beginner's system.

One in the Hand 154

By Steve Cummings They're small, they're inexpensive, they're sophisticated—but can hand-held scanners stand up to flatbeds and sheetfeds? We evaluate the new crop of black-and-white, gray-scale, and color models.



Optical Outlook
An erasable optical drive may solve your mass storage problems, page 138.

REVIEWS

SimEarth 1.0 162
Entertainment and educational software.

Four Wacom Styluses 164
Input devices.

SampleCell 1.1 169
MIDI sample playback board.

Ventura Publisher 1.0 170
Page-layout software.

Descartes 1.01 and MapInfo 1.0 175
Database-mapping software.

MacSPIRS 2.0 177
SilverPlatter CD ROM front end.

Studio/8 2.0 182
Color paint program.

ThoughtPattern 1.0 182
Personal information manager.

VideoQuill 1.0 186
Character-generation software.

Window Shopping 189
Quotemaster Plus/Mac 4.0; Instant Library of Quotations 1.0; Expert Backgammon 1.85, MasterFinder 1.0; Peacock 2.0; ScriptEdit 2.0; Protector Shark 1.1; Mac Minder, Mac II Minder, Mac Side Minder.

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Puts	12 27 84	1 0	$3 00	$209 25	$30,209 25	01/09/85	$4 25	$226 25	$42,273 75	$12,064 50
Calls	01 29 85	100	$4 38	$230 00	$43 980 00	02/11/85	$5 63	$267 50	$55 982 50	$12,002 50
Puts	03 12/85	100	$2 88	$209 25	$28,959 25	03/19/85	$4 00	$218 75	$39 781 25	$10,822 00
Calls	04 26 85	100	$3 50	$209 25	$35,209 25	05/20/85	$6 75	$501 25	$67,198 75	$31,989 50
Calls	06/26/85	100	$2 38	$209 25	$23,959 25	07/01/85	$3 13	$[illegible] 25	$31,040 75	$7,081 50
Calls	07 18 85	100	$5 00	$248 75	$50,248 75	07/23/85	$3 75	$211 25	$37,288 75	($12,960 00)
Puts	08/13/85	100	$1 25	$209 25	$32,709 25	08/26/85	$[illegible]	$209 25	$27,290 75	($5,418 50)
Puts	09 16/85	100	$2 25	$209 25	$22,709 25	09/26/85	$[illegible]	$209 25	$24,790 75	$2,081 50
Calls	11 05/85	100	$4 88	$245 00	$48,995 00	12/[illegible]	$[illegible]	$687 50	$195 362 50	$146,567 50
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Calls	03/12/86	100	$4 75	$241 25	$47,741 25	0[illegible]	$9 63	$387 50	$95,862 50	$48,121 25
Calls	05/21/86	100	$4 50	$[illegible] 75	$45,233 75	0[illegible]/86	$9 75	$391 25	$97 108 75	$51,875 00
Calls	08/06/86	100	$4 13	$222 50	$41,[illegible]	0[illegible]/86	$12 [illegible]	$481 25	$127,018 75	$85,546 25
Calls	09 17/86	100	$4 50	$233 75	$45,[illegible] 75	11/13/[illegible]	$[illegible] 88	$305 00	$68,445 00	$23,211 25
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Puts	01/02/87	100	$2 38	$209 25	$[illegible] 25	01/[illegible]	$[illegible] 00	$209 25	$9,790 75	($14,168 50)
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Calls	03/20/87	100	$4 75	$[illegible]47,741	$[illegible]07/87	$[illegible]	$346 25	$82,153 75	$34,412 50
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Puts	05/19/87	100	$4 88	$[illegible]99 [illegible]	05/[illegible]	$[illegible] 50	$[illegible]	$74,676 25	$25,681 25
Calls	06/17/87	100	$4 [illegible]	$[illegible]226 25	[illegible]/26/[illegible]	$8 25	$[illegible] 25	$82,153 75	$39,427 50
Calls	07/31/87	100	$[illegible]	$209 25	$[illegible]459 25	0[illegible]/87	$8 00	$[illegible]48 75	$49,751 25	$18,292 00
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Puts	09/09/87	100	$[illegible]	$234 [illegible]	$[illegible]43 [illegible]	09/10/87	$[illegible]	$209 25	$36,040 75	($7,939 25)
Puts	10/08/87	100	$7 [illegible]	$303 [illegible]	$[illegible]303 [illegible]	10/20/87	$[illegible]	$2,756 50	$967,242 50	$889,439 37
Puts	11/10/87	100	$5 00	$249 [illegible]	$[illegible]249 75	11/[illegible]	$[illegible] 69	$[illegible] 38	$56,605 63	$6,356 88
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Calls	02/11/88	100	$2 25	$209 25	$[illegible],709 25	02/[illegible]/88	$7 [illegible]	$[illegible]	$75,922 50	$53,213 25
Puts	03/25/88	100	$2 38	$209 25	$33,959 25	03/05/88	$[illegible]	$[illegible]	$55,982 50	$22,023 25
Calls	05/16/88	100	$4 63	$237 50	$46,[illegible]	05/16/[illegible]	$[illegible]	$[illegible] 25	$52,243 75	$5,756 25
Calls	05/26/88	100	$4 25	$226 25	$[illegible]	06/27/[illegible]	$[illegible] 00	$[illegible]48	$149,451 25	$106,725 00
Calls	08/01/88	100	$4 00	$218 75	$[illegible]218 75	08/[illegible]/88	$2 [illegible]	$[illegible] 25	$26,040 75	($14,178 00)
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Puts	10/05/88	100	$3 25	$209 25	$[illegible]2,709 25	10/[illegible]/88	$2 [illegible]	$209 25	$19,790 75	($12,918 50)
Calls	10/18/88	100	$5 50	$263 75	$55,[illegible]	10/21/[illegible]	$[illegible]	$383 75	$94,616 25	$39,352 50
Calls	01/09/89	100	$7 13	$312 50	$71,[illegible]	02/[illegible]/89	$[illegible]	$638 75	$179,361 25	$107,798 75
Calls	02/17/89	100	$6 25	$286 25	$62,7[illegible] 25	0[illegible]/89	$[illegible] 25	$256 25	$52,243 75	($10,542 50)
Puts	02/23/89	100	$3 75	$211 25	$37,711 25	03/[illegible]/89	$4 88	$245 00	$48,505 00	$10,793 75
Calls	03/06/89	100	$5 63	$267 50	$56,517 50	03/[illegible]/89	$8 38	$350 00	$83,400 00	$26,882 50
Calls	03/29/89	100	$6 38	$290 00	$64,040 00	04/[illegible]/89	$10 75	$421 25	$107,078 75	$43,038 75
Puts	05/10/89	100	$2 63	$209 25	$26,459 25	05/12/89	$1 75	$209 25	$17,290 75	($9,168 50)
Calls	07/06/89	100	$5 75	$271 25	$57,771 25	08/14/89	$25 00	$673 25	$249,326 75	$191,555 50
Calls	08/24/89	100	$3 63	$209 25	$36,459 25	08/25/89	$8 13	$342 50	$80,907 50	$44,448 25
Calls	09/28/89	100	$4 13	$222 50	$41,472 50	10/09/89	$11 25	$436 25	$112,063 75	$70,591 25
Calls	12 29/89	100	$4 13	$222 50	$41,472 50	01/03/90	$8 25	$346 25	$82,153 75	$40,681 25
Puts	01/09/90	100	$5 50	$263 75	$55,263 75	01/15/90	$13 00	$488 75	$129,511 25	$74,247 50
Puts	01/16/90	100	$8 75	$361 25	$87,861 25	01/24/90	$14 88	$545 00	$148,205 00	$60,343 75
Puts	02/21/90	100	$4 25	$226 25	$42,726 25	02/26/90	$2 94	$186 88	$29,188 13	($13,538 13)
Calls	03/16/90	100	$6 63	$297 50	$66,547 50	03/20/90	$10 00	$398 75	$99,601 25	$33,053 75
Calls	04/[illegible]	[illegible]	$[illegible]	$[illegible]	$[illegible]	04/[illegible]/90	$[illegible]	$[illegible]	$[illegible]	$[illegible]
Puts	04/19/90	100	$5 00	$248 75	$50,248 75	04/27/90	$10 00	$398 75	$99,601 25	$49,352 50
Calls	05/08/90	100	$4 75	$241 25	$47,741 25	05/14/90	$19 25	$676 25	$191,823 75	$144,082 50
Calls	06/22/90	100	$6 63	$297 50	$66,547 50	06/25/90	$3 63	$207 50	$36,042 50	($30,505 00)
Puts	08/07/90	100	$7 88	$335 00	$79,085 00	08/24/90	$22 25	$766 25	$221,733 75	$142,648 75
Calls	01/17/91	100	$12 88	$485 00	$129,235 00	01/18/91	$19 00	$668 75	$189,331 25	$60,096 25
Calls	01/21/91	100	$10 63	$417 50	$106,667 50	02/13/91	$32 00	$1,058 75	$318,941 25	$212,273 75
										$3,320,230.67

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Future results may vary. All programs not available for all computers.

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June 1991, Volume 8, Number 6
Macworld (issn 0741-8647) is published monthly by Macworld Communications, Inc., 501 Second Street, San Francisco, CA 94107. Subscription rates are $30 for 12 issues, $60 for 24 issues, and $90 for 36 issues. Foreign orders must be prepaid in U.S. funds with additional postage. Add $18 per year for postage for Canada and Mexico subscribers. Add $69 per year for foreign postage to all other countries. Second class postage paid at San Francisco, California, and at additional mailing offices. POSTMASTER: Send address changes to *Macworld*, P.O. Box 54529, Boulder, CO 80323-4529. For dealer inquiries, call 800/999-1170. Editorial and business offices: 501 Second St., San Francisco, CA 94107. 415/243-0505.

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The New Color Pivot Shown In Landscape And Full-Page Mode.

The comparison you see above is really no comparison at all. ● If you live in a world where things are all middle with no top or bottom, or where the year has only six months, you might choose the Apple.® But if you would like to see a full page of color graphics, and see twelve months of spreadsheet instead of merely six, and be able to go from portrait to landscape with swift and deft ease, *and* own the only color full-page display on the





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The Apple 13" Shown In Landscape And...Uh...Paperweight Mode.

market, you will probably choose the Color Pivot.™ Okay, you will definitely choose the Color Pivot. ● The Color Pivot is compatible with all color capable Macs. And on the Mac IIsi and IIci with built-in video, the Color Pivot needs no interface. But when all is said and done, perhaps the best thing about the Color Pivot is that, well, it's a Pivot. ● For more information, or the location of your nearest Radius reseller, call 1 (800) 227·2795.

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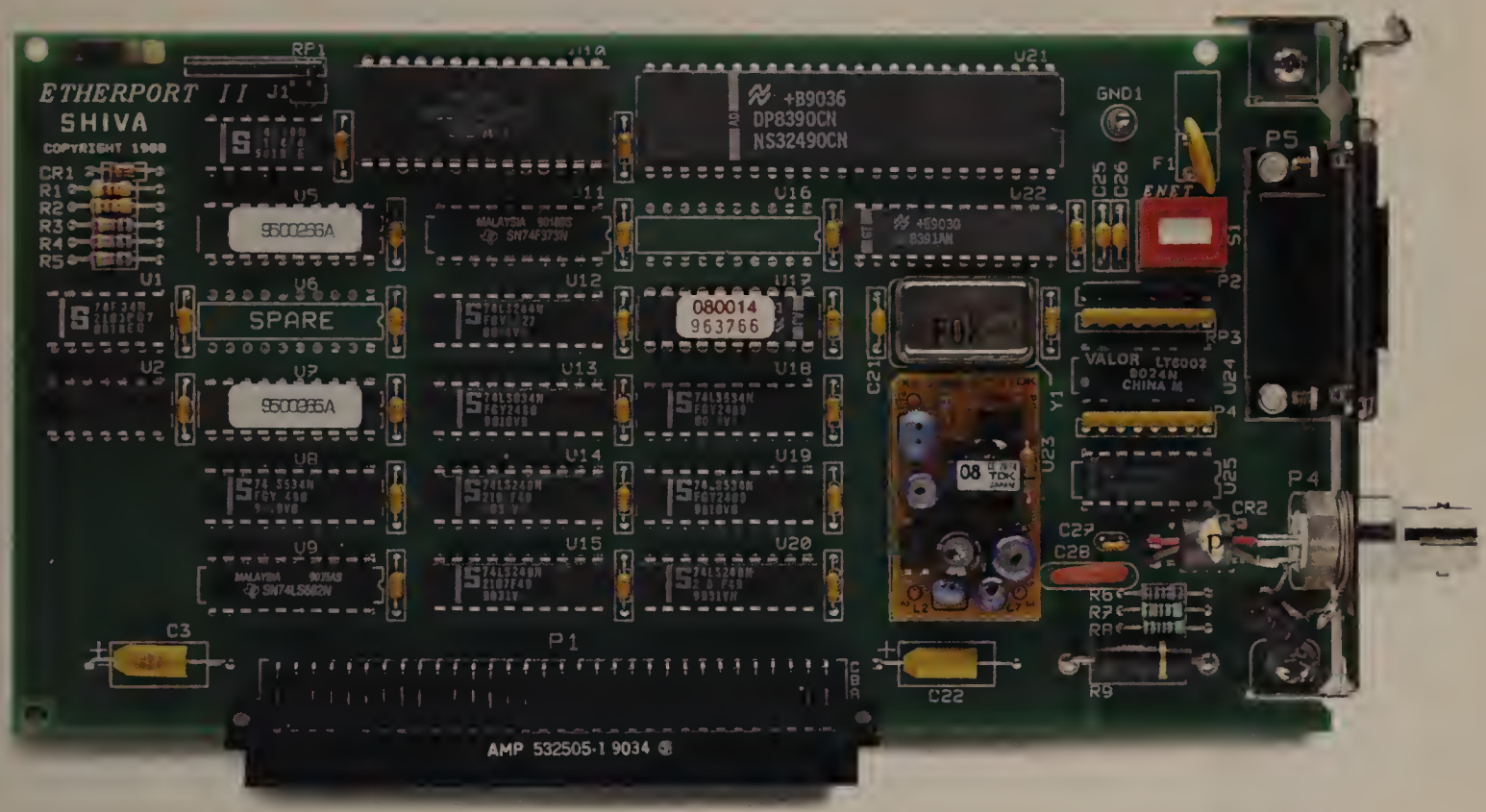
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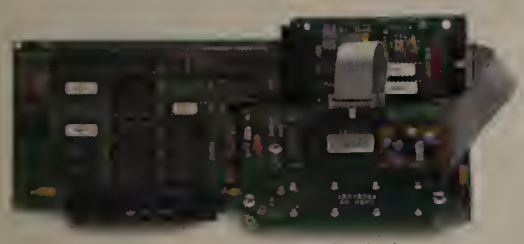
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Novell's EtherPort is now a Shiva product.



EtherPort cards are available for a variety of Macintosh models.

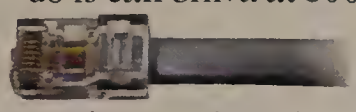
The day we introduced our newest product, a lot of people already owned it. Because EtherPort,® the leading Macintosh Ethernet card sold by Novell, is now a Shiva product.

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Shiva is now the company to contact for all EtherPort support.

If you're already using EtherPort, all you have to do is call Shiva at 800-458-3550, or 617-252-6300, for your free driver upgrade. And if you're looking to purchase an Ethernet card, call the same numbers to find out which card is best for your Mac. You'll find it's easy to connect with Shiva.



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Remember the first day you got your hands on a Mac?
Remember how excited you felt when you saw all the things it could do?
This may refresh your memory.

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Doc 1: Movies Shorts 2

No Columns 100%

Movie Shorts

Volume VII, Number II October 1990

Modern Day Boom Towns



Hollywood's raid on suburban America is making money for merchants. That's why vendors don't balk at the inconvenience of having directors, cinematographers, actors, and teamsters swarming around quiet city centers. Film crews on location bring staggering movie budgets that translate into staggering profits for local retailers. In many instances, businesses notice a 328-358% increase in sales. Here are a few overnight success stories:

Tearsville, Oklahoma

To film the 11-minute banging scene in *Tomorrow We Die*, director Michael Grayson required 2 weeks of shooting and 52,200 doughnuts, 600 gallons of chocolate milk, 700 loaves of cinnamon bread, 3,000 pastries, and 29 bran muffins. The gluttonous order amounted to 4 months' worth of sales at George's Gluten' Goodies

Pg 1 Ln 2

Introducing WordPerfect® 2.0.

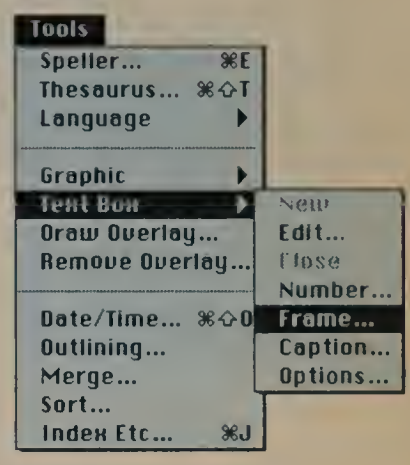
Every once in a while a new product comes along that sparks the same kind of excitement you may have experienced with your first Macintosh (you stayed up half the night, right?). As we've shown new WordPerfect® 2.0 to Macintosh users around the country, we've seen a very similar reaction. First eyes open wider. Then heads start to nod. Followed by grins that stretch dimple to dimple.



Here are some of the more graphic improvements.

We built a graphics and drawing package right into the program. With WordPerfect 2.0, you don't have to leave your document to incorporate graphics. You can create, edit, size, scale and crop graphic figures just by clicking "graphics" or "draw" on the pull-down menu. The palette includes all of the standard drawing tools, plus Bezier curves, polygons and a free rotation tool.

WordPerfect 2.0 also lets you create text boxes. Inside your text boxes you can change font size and attributes. Then you can drag your text box wherever you want in your document and the rest of your text will wrap around it automatically.



The list of new features could fill a page. Or up to 24 columns.

By clicking and dragging icons on the new WordPerfect ruler, you can create columns (newspaper or parallel) and then adjust the column settings, align text, set tabs, change line spacing, move margins and do a number of other formatting changes to your document.

Want to add a border to text, paragraph, column, or page? Easy. WordPerfect 2.0 gives you 36 different border styles from which to choose.

Like working with Styles? WordPerfect not only lets you use them, you can also share your styles with other people on your network.

We've also added new features like a Macro Editor, Tables of Authorities, and Line Numbering. And we've made enhancements to Merge, Search and Replace, and Macros.



Of course, what counts is how you feel.

See WordPerfect 2.0 up and running at your dealer. Better yet, buy a copy of WordPerfect 2.0 and load it onto your Mac. But when you try WordPerfect 2.0 for the first time, one word of warning. Don't plan on going to bed early.

For more information, call us at **(800) 526-5034.**



WordPerfect
CORPORATION

1555 North Technology Way, Orem, Utah 84057
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Q. A.

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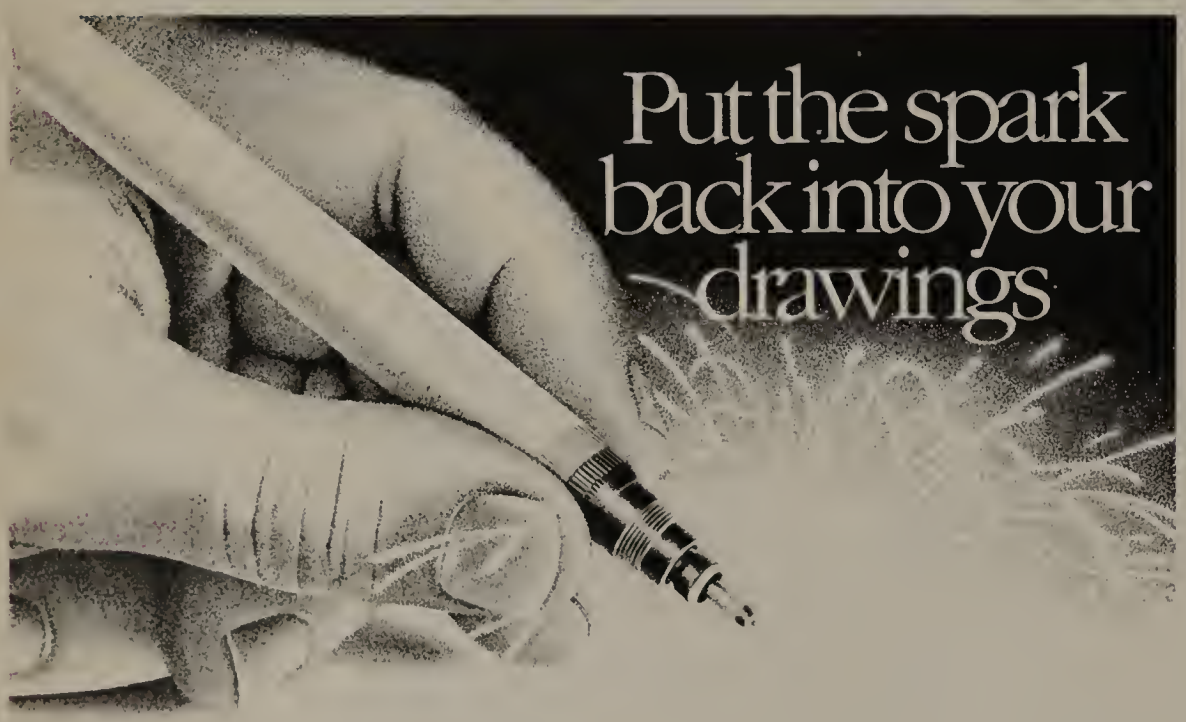


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MacUser



EDITORS' CHOICE AWARD WINNER

Introducing the Interfax 24/96

Circle 43 on reader service card

Our Newest Introduction.



Color monitor illustration by Rob Mageira

Since 1985 Ehman has been a leader in providing high quality peripherals to the Macintosh market. Our hard drives, monochrome monitors and removable drives have been a mainstay to the industry, with a name that is well known and highly respected.

Now allow us to introduce the newest



All hard drives come bundled with your choice of two utility software packages and a 2-year warranty.

member of our family; 20 inches of 8-bit and 24-bit color in high quality, 72 DPI monitors that end users will love, and budget watchers will adore.

The new Ehman 2-page color monitors are as affordable as they are practical. Backed up by a one year warranty and our 30 day money back guarantee, the price tags once again demonstrate Ehman's commitment to value on the most popular peripherals.

The other members of the family are just as cost conscious. From the impressive 185MB drive to our popular 45MB removable and the highly

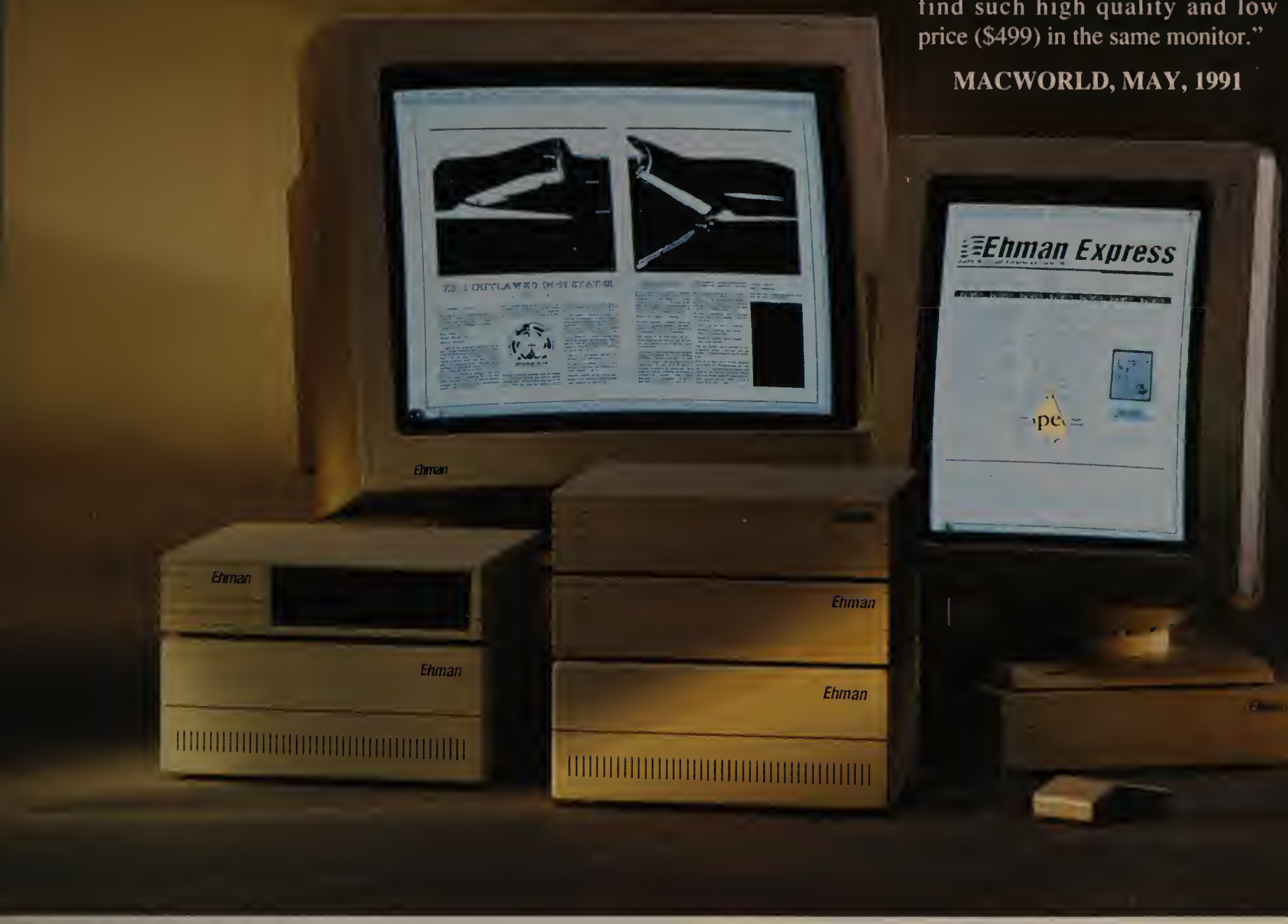
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"At $899, Ehman's Two-Page Monochrome display is an excellent buy."

MACWORLD, MAY, 1991

"If you want a full-page display, we recommend the Ehman: it's rare to find such high quality and low price ($499) in the same monitor."

MACWORLD, MAY, 1991



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Internal	$225	$245	$249	$345	$285	$335	$405	$555	$715	$755	$695	$775	$845	$1,245	$1,625	$1,795	$2,445
External	$269	$289		$389	$319	$379	$459	$589	$759	$789	$739	$819	$889	$1,289	$1,669	$1,839	$2,489
Removable 45 MB Hard Drive $489					Color 20" Monitor 8-Bit $2,895 24-Bit $3,945				Monochrome/Gray Scale 19" Monitor Monochrome $895 Gray Scale $1,495					Monochrome 15" Monitor $495			

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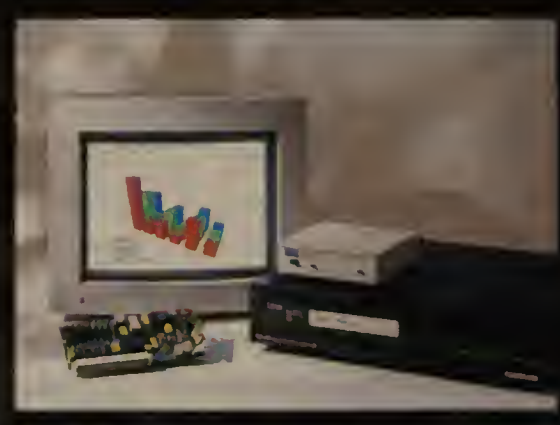
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8-Bit Video Output Adaptors allow Macintosh II images and presentations to be captured on video tape. Available in NTSC and PAL versions.

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MacBulletin

Apple Cuts Prices on Macs and Printers, Ships Cache Card

Apple recently cut prices of the Macintosh IIfx, IIci, and SE/30 by amounts ranging from $700 to $2300. The IIfx with 4MB of RAM and a 160MB hard drive fell from $10,969 to $8669. The IIci with 5MB of RAM and a floppy disk only went from $5969 to $5269, and a IIci with 5MB of RAM and an 80MB hard drive dropped from $6669 to $5969. The SE/30 with 1MB of RAM and a 40MB hard drive was reduced $1000 to $3369 while the model with 4MB of RAM and an 80MB drive was cut $1700 to $3869. The company also cut the price of the Personal LaserWriter NT from $3299 to $2599, of the LaserWriter IINT from $4499 to $3999, and of the LaserWriter IINTX from $5999 to $4999. Apple also said it has begun shipping its $399 Macintosh IIci Cache Card, which improves performance by up to 30 percent. For more information call your Apple dealer.

Prodding Prodigy

Disgruntled users and former users of Prodigy's online system have filed a class-action lawsuit against Prodigy, charging the Sears/IBM joint venture with deceptive advertising and failing to notify users before beginning to charge for electronic mail. Before Prodigy E-mail charges went into effect, users had been generating great volumes of messages in an attempt to circumvent Prodigy's censorship of public message boards, and several members' accounts were terminated. For more information, write the attorneys in the case, Greenfield and Chimicles, at P.O. Box 100, Haverford, PA 19041-100.

Hayes Enforces Modem Patent, Prices May Rise

After winning a multimillion-dollar suit against Everex Systems, Ven-Tel, and OmniTel, Hayes Microcomputer Products said it would continue to enforce its controversial Heatherington '302 Patent against other vendors who do not license it. The patent covers escape codes used in all Hayes Smartmodems, codes that have since been used by every manufacturer that adheres to the de facto Hayes compatibility standard. Some industry observers believe that the cost of damages and of licensing may cause modem prices to reverse their downward trend.

Sculley Says Two Portable Macs on the Way

At a recent speech, Apple chairman and CEO John Sculley said that the company expects to ship two new portable computers by the end of 1991. Industry observers expect the systems to be a notebook-size computer, possibly done in cooperation with Sony, and a true laptop.

SuperMac Unveils Big-Screen Displays for LC and IIsi

SuperMac Technology has introduced two 8-bit graphics boards that support monitors as large as 21 inches, one for the Macintosh LC and the other for the IIsi. Both have a 75Hz refresh rate and support a wide range of color and gray-scale monitors, starting as small as 12 inches. They include hardware pan and zoom, and Virtual Desktop, which supports a resolution of 4096 by 1536 pixels for viewing large documents. The boards, called the Spectrum/8 LC and the Spectrum/8 si, both have a suggested retail price of $999 and began shipping at the end of March. The Mac IIsi board fits directly into the IIsi slot, eliminating the need for Apple's PDS adapter board, and contains a socket for an optional FPU chip. For more information, contact SuperMac at 408/245-2202.

NEC Rolls Out CD ROM Players

NEC Technologies has announced two CD ROM players for the Macintosh—the high-performance Intersect CDR-73 external drive, and the Intersect CDR-36, a portable device. The CDR-36, which offers an average access time of 500ms, replaces the CDR-35 portable player, which had an average access time of 1500ms. The new portable weighs 2.2 pounds by itself and 3 pounds including an optional $99 battery. It lists for $698 with a Macintosh SCSI interface. The CDR-73 has an average access time of 300ms and lists for $999 with Macintosh interface. Both players are scheduled to begin shipping in May. For more information, call NEC at 800/366-3632.

. . . Nor Gloom of Night

Lotus and Microsoft are devouring little companies as they prepare to butt heads in the fast-growing E-mail market. Lotus recently acquired cc:Mail, a DOS and Windows E-mail vendor whose recently announced Mac server will pit Lotus against Microsoft's Macintosh-only Microsoft Mail. Microsoft has acquired the Network Courier products from Consumers Software, which recently announced application programming interfaces (APIs) for its DOS products that, like Microsoft's APIs for Mail, allow

(continues)

third-party applications to transfer information on a network by hitching a ride on Network Courier mail. cc:Mail will remain in Mountain View, California, at 415/961-8800. At press time, Consumers' status was undecided. For more information, call Microsoft at 206/882-8080.

Iomega Cuts Prices of Removable Bernoulli Drives

Iomega Corporation has dropped the list price of its 44MB removable cartridge drives by 10 percent for the Transportable and by 7 percent for the Dual, which includes two drives in the same case. The new list price for the Transportable is $1259, which the company expects will yield a street price under $1000. The Dual now lists for $2399. For more information, contact Iomega at 801/778-1000 or 800/456-5522.

Strata's First Move

Version 2.0 of StrataVision 3d will add animation capability, as well as an open architecture to let programmers write extensions for rendering, modeling, and other purposes. To animate, you set an object's positions at key times, and StrataVision creates the path for the intermediate times. Objects' movement can be hierarchically linked, but without sophisticated controls like limiting range of motion to create, for example, a cam. StrataVision 3d 2.0's modeler supports organic-looking spline-based surfaces, which you can combine with polygon mesh surfaces in a single object; 2.0 also adds support for solid textures. Version 2.0 will list for $695. Strata is at 801/628-5218.

RagTime, DesignStudio Revved

RagTime has upgraded its omnibus page layout, spreadsheet, and graphing package to version 3.1 with support for XTND filters, 2½-D capability for all graph types, and better manuals. Its price remains $599. RagTime USA is at 415/780-1800. Letraset's DesignStudio 2.0 includes a version of the Separator annex that is available for ColorStudio, the ability to scale text horizontally, and Pantone color support. It lists for $795. Letraset is at 201/845-6100.

Apple to Add Manufacturing Plant in Colorado

Trying to catch up with overwhelming demand for the low-cost Macs, Apple has bought a 340,000-square-foot building in Fountain, Colorado. Formerly owned by Data General, the building will join other existing Apple factories in Cork, Ireland; Singapore; and Fremont, California. About 800 to 1000 workers will manufacture Macintoshes at the site.

Yet Another Finder Replacement

Mr. File is a file- and disk-management utility in the tradition of DiskTop, DiskTools, and MasterFinder. It differs in two ways from those earlier products: you can set up several tasks to perform in a batch, start them running, and push Mr. File into the background while you continue working; you can also save lists of files to reuse in operations like copying working files to a floppy each day or launching a group of applications and files. Mr. File lists for $99. For more information, contact Softways at 408/978-9167.

Service Recovers Lost Data on SyQuest Cartridges

DriveSavers has begun offering a data-recovery service for SyQuest cartridges. The company, which is working closely with SyQuest, says its combination of special hardware and software can currently restore more than 90 percent of the data on more than 90 percent of the cartridges it receives at its facility in Novato, California. The cost of the service is $75 an hour, with a minimum 1-hour charge. Most repairs take 2 to 3 hours and are done within 72 hours after receipt of the disk. Twenty-four-hour turnaround is available at extra cost. DriveSavers will give estimates, and customers can put a cap on how much they wish to spend. For more information, contact DriveSavers at 415/883-4232.

Apple Distributes Handwriting-Recognition Device in Japan

Perhaps foreshadowing future developments for the U.S. market, Apple has begun distributing in Japan a device that recognizes handwriting in the Latin alphabet and in three Japanese alphabets: kanji, katakana, and hiragana. Called MacHandwriter, the product was jointly developed by Communication Intelligence Corporation (CIC) and Apple Pacific. The MacHandwriter is compatible with any Mac that runs KanjiTalk, Apple's Japanese version of the Macintosh Operating System, and with all Mac applications, according to CIC. MacHandwriter is scheduled to ship this summer. For more information, contact CIC at 415/328-1311 or an Apple Pacific dealer.

Texas MacStuf Closes Its Doors

In March, mail-order company Texas MacStuf went out of business after operating at a loss for some time, according to the company. The closure left some customers holding the bag after they had prepaid for products that were never delivered. The company said it did not intend to file for bankruptcy, but did not rule out the possibility. It said it is working with its bank and customers to repay its debts. For more information, contact Texas MacStuf's parent, Cork Computer, at 512/343-1301.

C-Cube Demonstrates MPEG Full-Motion Video

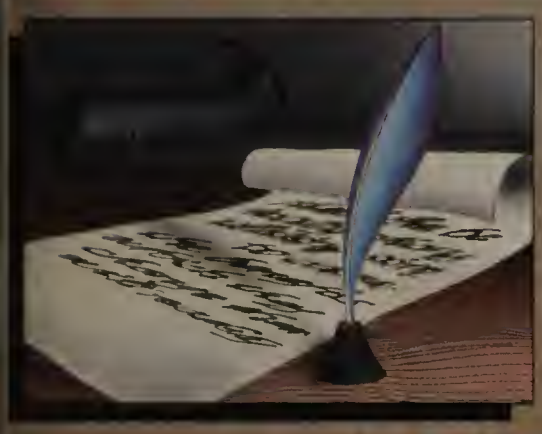
C-Cube Microsystems recently gave a technology demonstration of a video decoder/processor designed to decompress MPEG full-motion video images in real time. MPEG, a proposed standard still under development, is designed to provide fast decompression of images that are highly compressed by video content providers. The compression can be at a ratio as high as 50 to 1. For more information, contact C-Cube at 408/944-6300. □

The Evolution of CAD

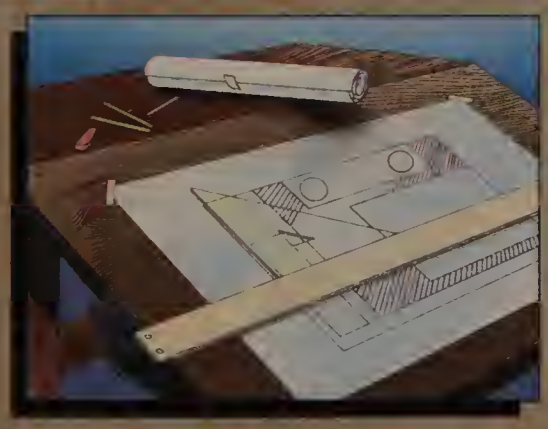
From the beginning of time, man has tried to express himself through graphics.



In the beginning man had to use primitive tools for creating graphic designs.



In the 15th Century design tools were quill ink pens and crude styles of paper.



By the 18th Century man had advanced to the drafting table with the T-squares, slide rules, precision ink pens and the dreaded eraser.



In the 20th Century the first CAD programs were very slow and extremely difficult to use, not to mention the expense of buying them.



As programs became easier to use, they thought they were radical and intelligent, but lacked real CAD power.

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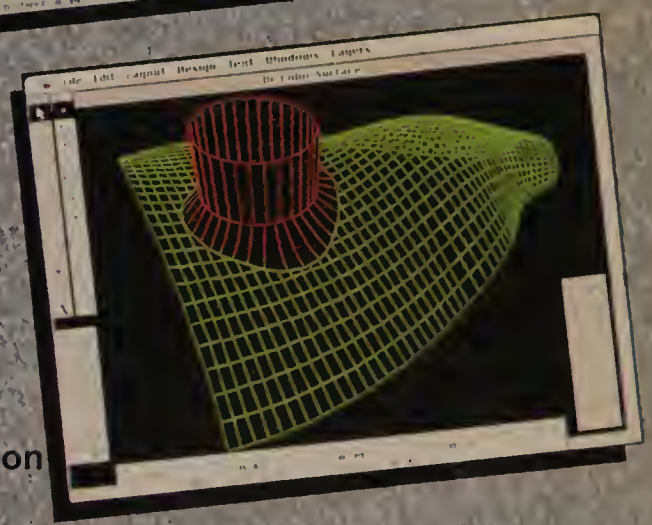
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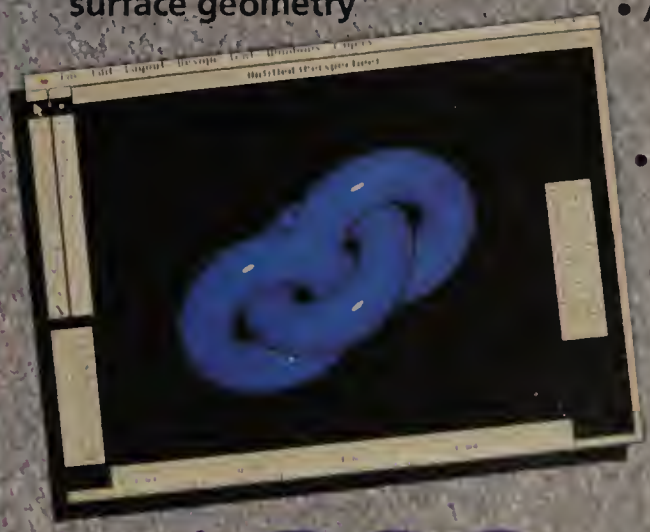
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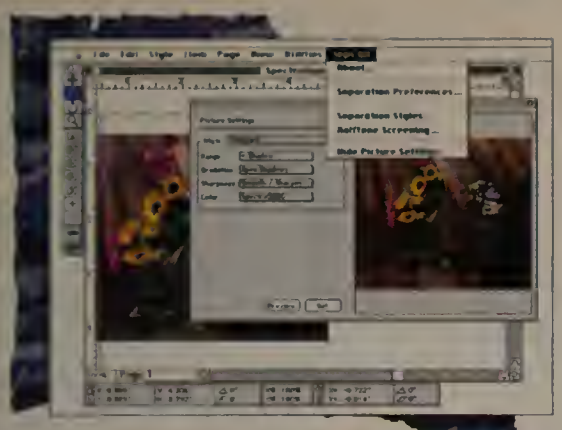
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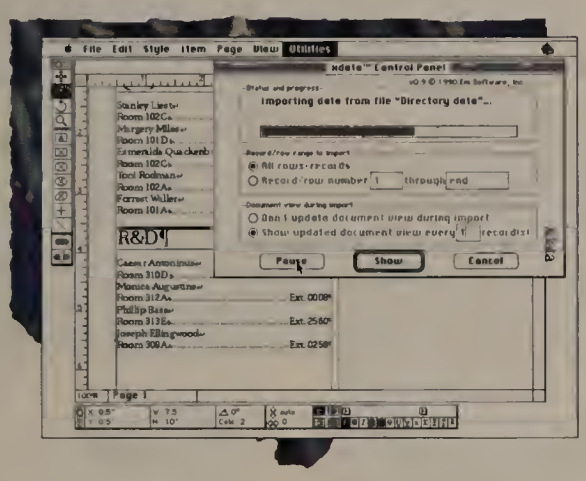


QuarkXPress working together with XTensions provides tailored applications for a broad range of publishing environments. XTensions are add-on software modules created by independent software developers that extend the features and capabilities of QuarkXPress. Currently you can choose among 43 XTensions, with more coming on line every day! These modules help you accomplish a variety of tasks ranging from data base publishing and continuous-tone color separations to automatic pagination and scanning. Using QuarkXPress as the core of your publishing system and adding XTensions for specific applications is a cost-effective way to solve complex publishing problems. Here are just a few examples of what XTensions can do for you.



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What's Happening to Desktop Publishing

PART ONE: GLOBAL PUBLISHING

BY JERRY BORRELL

It was technoweenie heaven for several hours last March when Shin-Ichi Adachi of Nippon Telegraph and Telephone (NTT) and I sat around a conference room table at Macworld in San Francisco, clanking our Jolt cola cans together and making Miller Time jokes. We howled and laughed for an hour together with Macworld Japan president and publisher David Ushijima, consultant Byron Wagner, and several NTT engineers, all of whom sat in David's office in Tokyo. Our late Friday evening, their Saturday morning, jokes crackled back and forth over speakerphones.

Questions about problems and shouts of success broke out every so often as our computers transmitted 8-bit color images to Tokyo or as David took control of our computers in San Francisco and launched applications. We watched the high-speed modem's lights blink furiously; we talked to David in Japan as he controlled the Mac in San Francisco. It seemed as if he was just sitting in the next room using our computers.

By the end of the evening we had spent an entire two hours online without a single interruption in the telephone service, and only one application crash. We had inaugurated the first practical, reliable, high-speed color transmission service between two members of our growing family of *Macworld* magazines throughout the globe.



PHOTOGRAPHS BY DRAKE SOREY

Farallon's Reese Jones, instigator and coconspirator in our worldwide high-speed network connections. "Doers" profile—wants to wire the world.

That's not to say that our feast of pizza and soft drinks was in recognition of beginner's luck. We had been working on this since last September. Six months of trial and, mostly, error. Now it began to be possible to envision *Macworld* on a truly global scale.

Growth of International Publishing

It all started a few years ago when executive editor Adrian Mello and I initiated an international network with the editors at Australian *Macworld* in Sydney. My goal was to enable those editors to access all of *Macworld*'s stories (and accompanying graphics) electronically through the use of modems, Farallon's Timbuktu/Remote software, a computer located in San Francisco, and a storage device (now an optical drive) that stores one complete year of stories. Over time many other *Macworld* magazines began to connect to our server. We have constantly tinkered with the system, adding storage capacity, faster computers, higher-speed modems. But by the fall of 1990, we seemed to have reached an impasse. So many editors around the world used the system that it actually began bogging down the server. During one two-week period we observed seven different countries downloading stories and art to their offices.

(continues)



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Problems were abuilding. Due to network traffic, notoriously unreliable international phone connections, our own experiments with the system, and occasional beta software, the editors in different countries were experiencing more and more difficulty in making reliable connections.

Two Key New Products

Then, on one of my semiannual visits to Farallon for an evening's conversation, company founder and president Reese Jones demonstrated a new product, Timbuktu version 4.0, which allows users to view computers on the same network in color. That set off an incredible train of thought for me. Because until that time, my colleagues at other *Macworld* magazines could see our central server only in monochrome. And because *Macworld* is so visual they were forced to download large graphics files from the United States in order to determine which images they wanted to print in their own magazines. Given the troublesomeness of the phone connections and the long periods required for transferring sizable graphics files, this was an especially weak link in our system. If editors could see our files in color, their task would be simpler.

As I discussed with Reese my problems and complained about the difficulties our sister magazines were having in connecting with Timbuktu/Remote to our international server and with the quality of standard phone wires, he made a suggestion. "Call Pacific Bell, Sprint, and MCI and ask about their Switch 56 service that provides 56,000-bits-per-second transmission speeds over standard phone wires. The installation is a bit expensive, but the charge for use is made to the user on an hourly basis." The phone connections would be more reliable and we would not have to bear the expense of costly, dedicated leased lines, according to Reese. Best of all, users would pay for the service based on their actual phone time.

So the following day I met with Macworld Lab manager Chip Carman and asked him to get cost estimates on the high-speed switched digital service. After three days Chip returned to report that no one really knew what



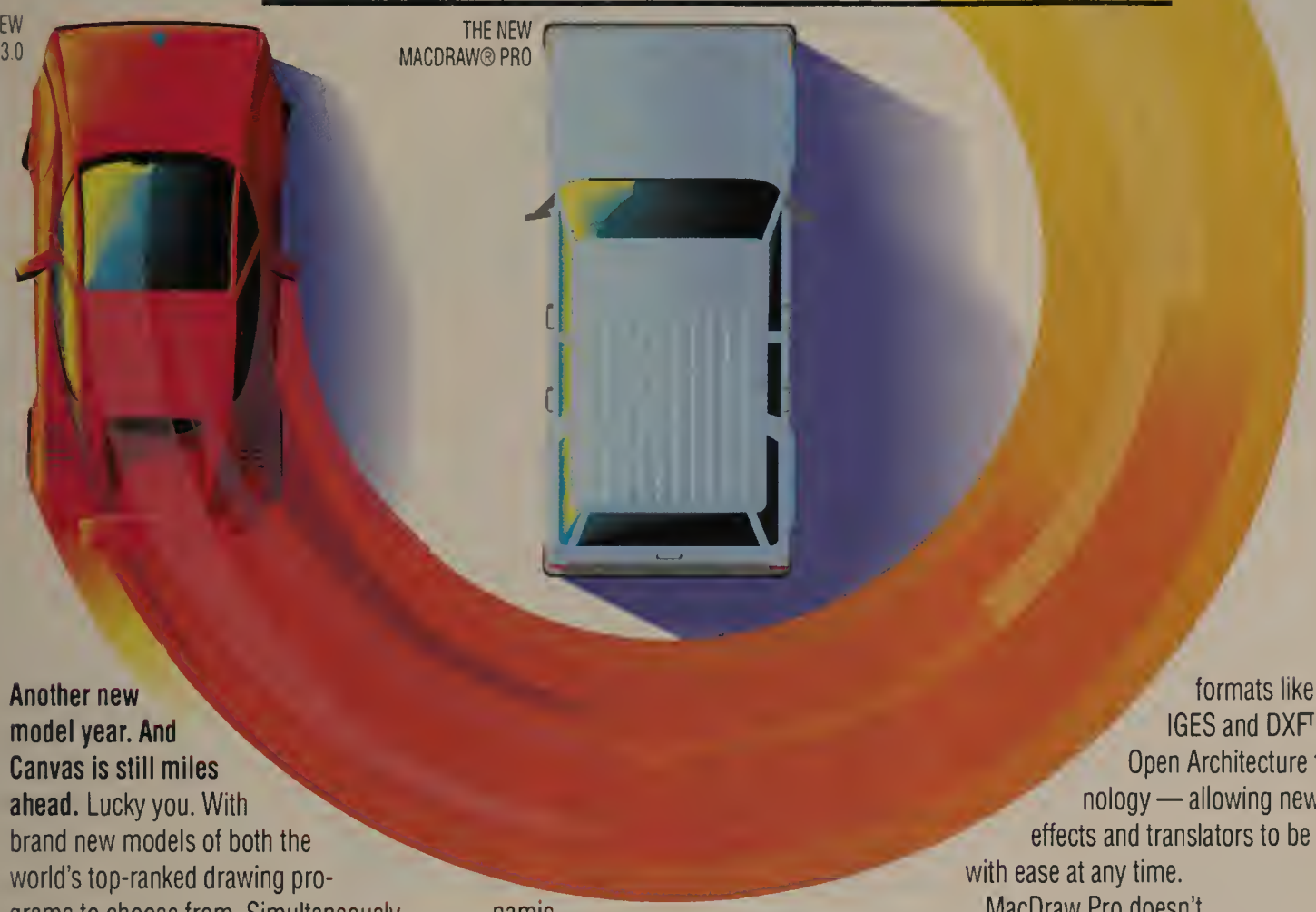
Chip Carman, Macworld Lab manager, sweating out the details of our ISDN and Switch 56 connection to Tokyo.

I was talking about, and that the only high-speed services they offered were for dedicated leased lines. Nevertheless I asked him to persist, and some days later Chip returned with the information that such services existed but that we would need to work with Pacific Bell if we wanted to move forward because AT&T seemed interested only in selling us leased lines. So he initiated conversations with Pac Bell and its Sprint team (salespeople within Pac Bell who sold the services of Sprint for long-distance transmissions) to investigate whether we could set up a Timbuktu 4.0 and Switch 56 service in time for the Macworld Exposition in January 1991. It seemed a long way off. If only we knew.

At about the same time I met with Radius president Mike Boich, who demonstrated another remarkable new product—ImpressIt, the first of a new generation of image-compression software products that can compress or decompress image files on the fly. One feature captured my attention almost immediately. It was a dialog box that provides a postage-stamp-size likeness of the compressed image and its file type (TIFF, JPEG, or PICT) and other information. Mike was taken aback by my enthusiasm for the new product, for I am typically slow to wax enthusiastic about new products. But ImpressIt and, as I was later to learn, PicturePress (from Storm Technology), in combination with Timbuktu 4.0 and Switch 56, would provide my international colleagues with the ability not only to view our server in color, but also to review images, including large continuous-tone image files (up to 90MB in size) from their

(continues)

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Michael Miramontes (left) and Jim Kirk of Pacific Bell with friend (CenPath-DMS switch). Miramontes spent five nonstop days securing our high-speed connections.

own machines in near-real time and then to download the images as compressed files.

Visions of sugarplum technofairies danced in my head. I saw us implementing in short order a system that would rival anything the mainstream publishing industry has or is putting in place with satellites, dedicated leased lines, huge hard drive storage systems, and millions of dollars in investments. And our sister *Macworlds* provided me with both the means and the excuse to bring all of these technologies together.

Hey Rocky—Watch Me Pull a Rabbit out of My Hat

Something began to go wrong about the time that I decided to tie in demonstrations of this new technology with major events such as corporate meetings, international Macworld Expos, and so on.

My excitement for the technology led me to attempt a demonstration of all three technologies for my boss's boss and my boss's peers from throughout the world. Fortunately, the demo was at a corporate meeting in Palm Springs so I only had U.S. telecommunications suppliers to contend with, but as the weeks leading up to the meeting passed I only had beta versions of the products to work with, and installing Switch 56 had bogged down. As the date drew inexorably nearer, I knew I was stuck with doing one of those talking demos of technology in which you ask an audience to imagine what something will be like if this or that works. It was horrible. I felt like a televangelist. The demo was like a puppet show—"Now imagine, if you will"—that sort of demo.

But the Macworld Expo in San Francisco was fast approaching, so I forgot that nightmare and looked forward to even better conditions because this demo would take place in our own backyard. Chip made progress with Northern Telecom and Solana Electronics—companies that produced the technology that would be required to make the demonstration work—and with our new friends at Pacific Bell. Chip and I met an impressive array of phone company executives, and I explained my plan for integrating these technologies during a demo at my keynote speech at the upcoming Expo. They agreed to speed up the installation of their Centrex service, which required installing two new phone wires in our building for use in the Switch 56 service.

As the event grew closer, the ability to communicate from our office in San Francisco to the site of the Expo, only blocks away, began to look ever more shaky. Pac Bell had the appropriate switching technology to make the connection, but somehow it wasn't working in tests. We just couldn't make the Northern Telecom–Solana Electronics H-Server combination communicate over Centrex. And more bad news—ImpressIt and Timbuktu 4.0 were still in beta. The uncomfortable feeling that I would be doing more high-tech hand-puppet shows for perhaps thousands of attendees unnerved me. Pac Bell trucks on the street outside our office began to slow traffic.

On the day before the Expo, Chip tested the service with Dave Crellen of Solana, Don Wicht of Northern Telecom, Paul Weigand of Farallon, and a crew from Jim Kirk's Pacific Bell group. We'd had a group demo earlier in our San Francisco office, connecting at high speed to the Northern Telecom offices in nearby San Ramon, but this was our first attempt to reach a location with a wiring path via Pac Bell's CenPath switches.

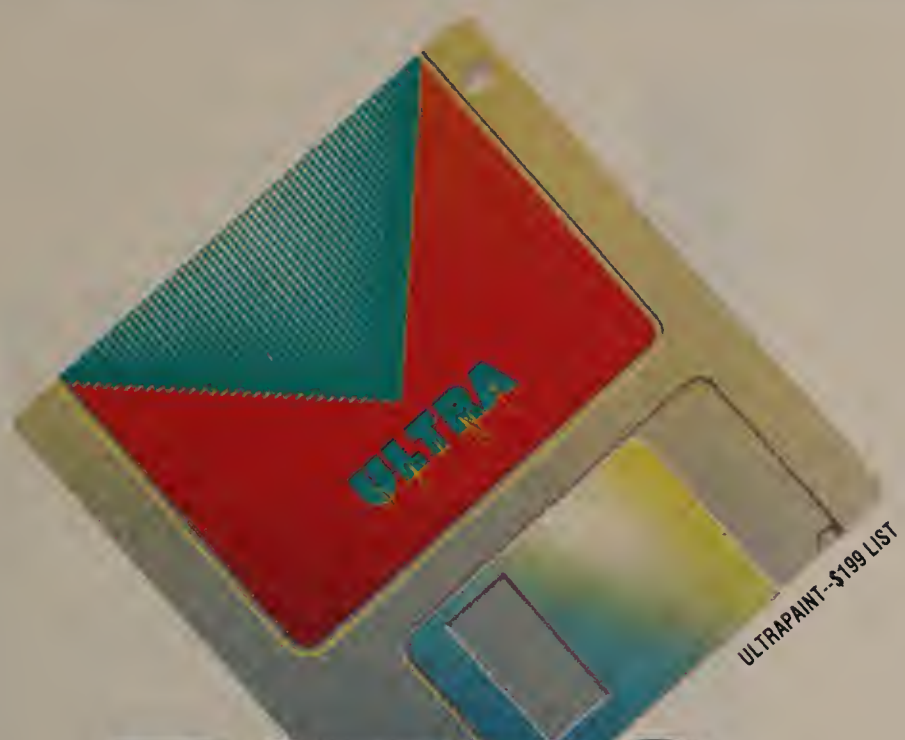
On the day of the Expo I was able to demonstrate the Switch 56 service and connect to our offices, only one portion of my goal. Back to televangelism. I was wondering if I should tell Pac Bell that I might be called back

(continues)



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Perhaps Chris Prior of MacUser UK summed it up best when he wrote that "UltraPaint...could prove to be the ideal software package for those looking for a powerful, all-around draw and paint program."

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chapter 15 THE DISAPPEARING RAIN FORESTS

Most tropical forests form a green band around the earth's center extending roughly 10 degrees north and south of the Equator. Amazing as it may seem, these forests occupy less than eight percent of the Earth's entire land mass, yet they account for nearly half of all the growing wood on the planet and are the home for two fifths of Earth's animal and plant species. It is because of the amazing diversity of species that the rain forests are so important to mankind for we rely on these for agriculture, medicine, and industry.



Figure 15.1 From 1950 to 1975, the amount of the earth's surface covered by tropical rain forest declined 15% to 12%. It is predicted to decline to 7% by the year 2000, and to 4% by the year 2025.

15.1 Natural Source of Products

At least a quarter of all pharmaceutical products are derived from tropical rain forests. An even more impressive statistic when you consider that less than one percent of all Amazon plants have been intensively examined for their medicinal properties.

Tropical rain forests have provided man with treatments for leukemia, Hodgkin's disease, breast, cervical, and testicular cancer as well as a wide array of analgesics, antibiotics, heart drugs, enzymes, hormones, diuretics, anti-parasite compounds, ulcer treatments, dentifrices, laxatives, dysentery treatments and anticoagulants. Of the 90,000 plant species in Latin America, only 10,000 have been tested for anti-cancer properties. Scientists expect that at least ten percent of the untested plants will reveal some form of anti-cancer activity. A species of alexa tree, found in the northern Amazon basin and Madagascar contains the plant alkaloid castanospermine which is being studied at St. Mary's hospital in London as a possible treatment for forms of AIDS.

Vast quantities of rubber from the rain forests provide such mundane items as tires, gum, and running shoes.

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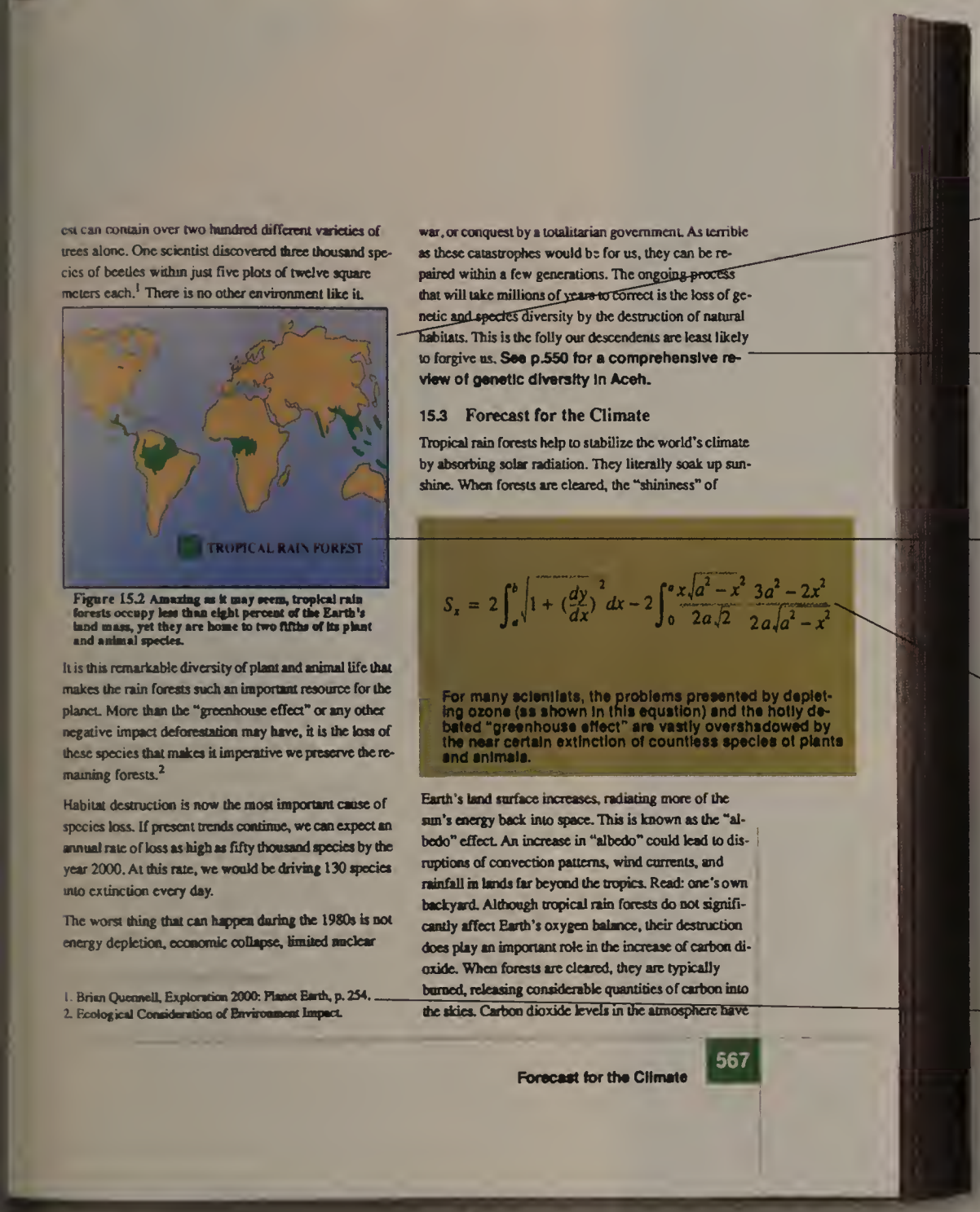
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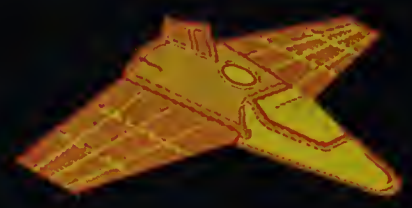
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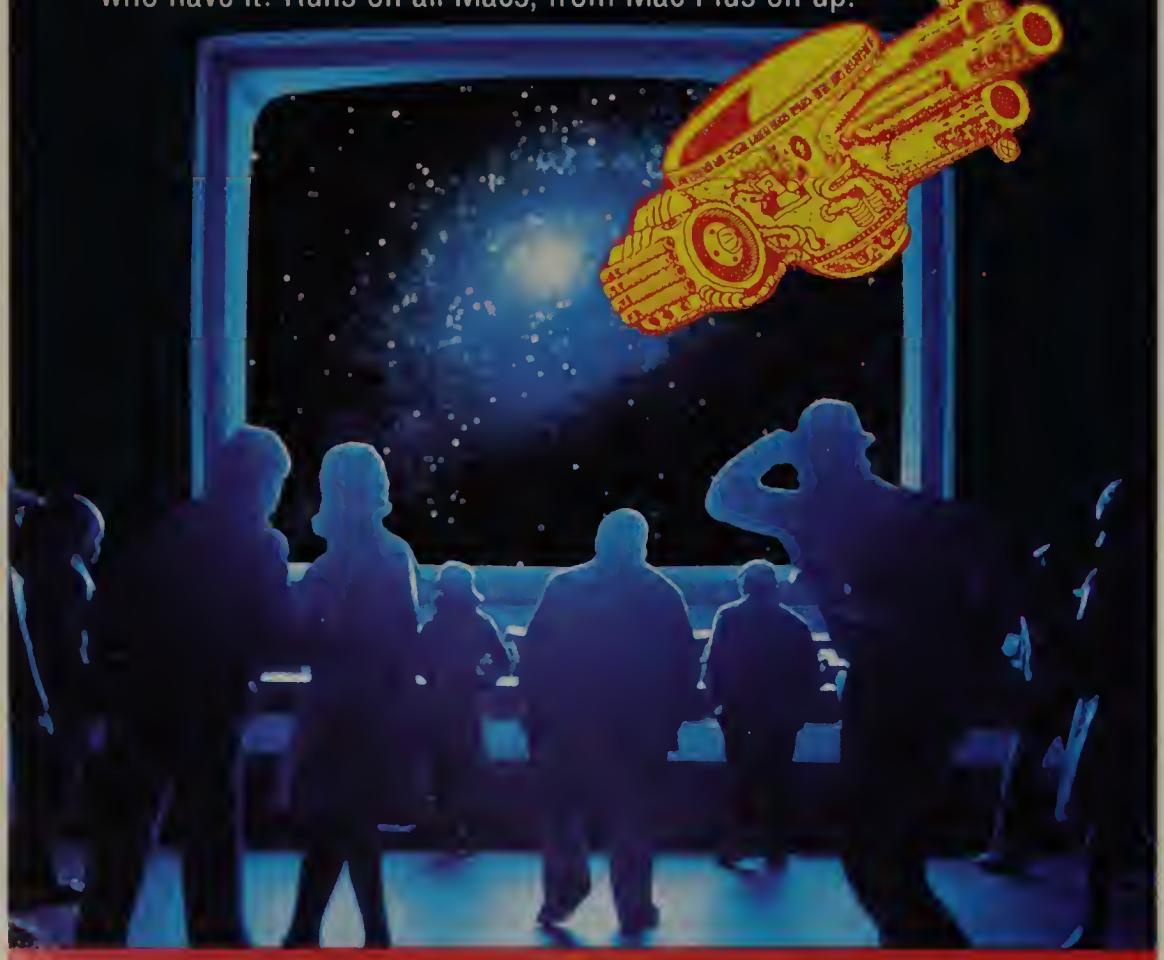
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to technoheaven if they didn't get everything working, but they came through.

Based upon that partial success we set our sights on my speech at the Macworld Expo in Tokyo the following month. Because the tale is long and multilingual, let me relate only one aspect, in which my computer arrived on the back of a motorcycle from Narita airport customs eight minutes before I was to speak. We did not, as you might expect, succeed in achieving an international connection between our Switch 56 and NTT's ISDN services. Our Solana H-Server and the NTT switches (transmitting at 64,000 bps) could not communicate. This we decided only after a handful of engineers spent several nights trying to solve various technical problems. But the frustration of that attempt seemed to focus the attention of the phone company officials, who determined that since they were selling this kind of service, it should work. And indeed, two weeks later we were able to establish a reliable connection with David Ushijima in the Macworld Japan offices in Tokyo. We changed from H-Servers to Engage Communication's SynchRouter. David could see our computer in color. And he was able to launch ImpressIt and view compressed color files.

Just the week before this success, we began working with Pacific Bell to install Switch 56 in London in time for our Expo in England and for use by Peter Worlock, editor of *Macworld* UK, but the local telecom company didn't know anything about Switch 56. They could sell us a leased line at 20 times the cost . . . but here my story begins to repeat itself.

Communications and Publishing

Probably the best part of this project was how it overlapped with the work that I was hoping to put in place with our in-house production. Since the May 1989 issue *Macworld* has been electronically published, with the exception of a few processes such as continuous-tone film production. That is part two of the story—how electronic publishing and communications have finally begun to overlap. ■

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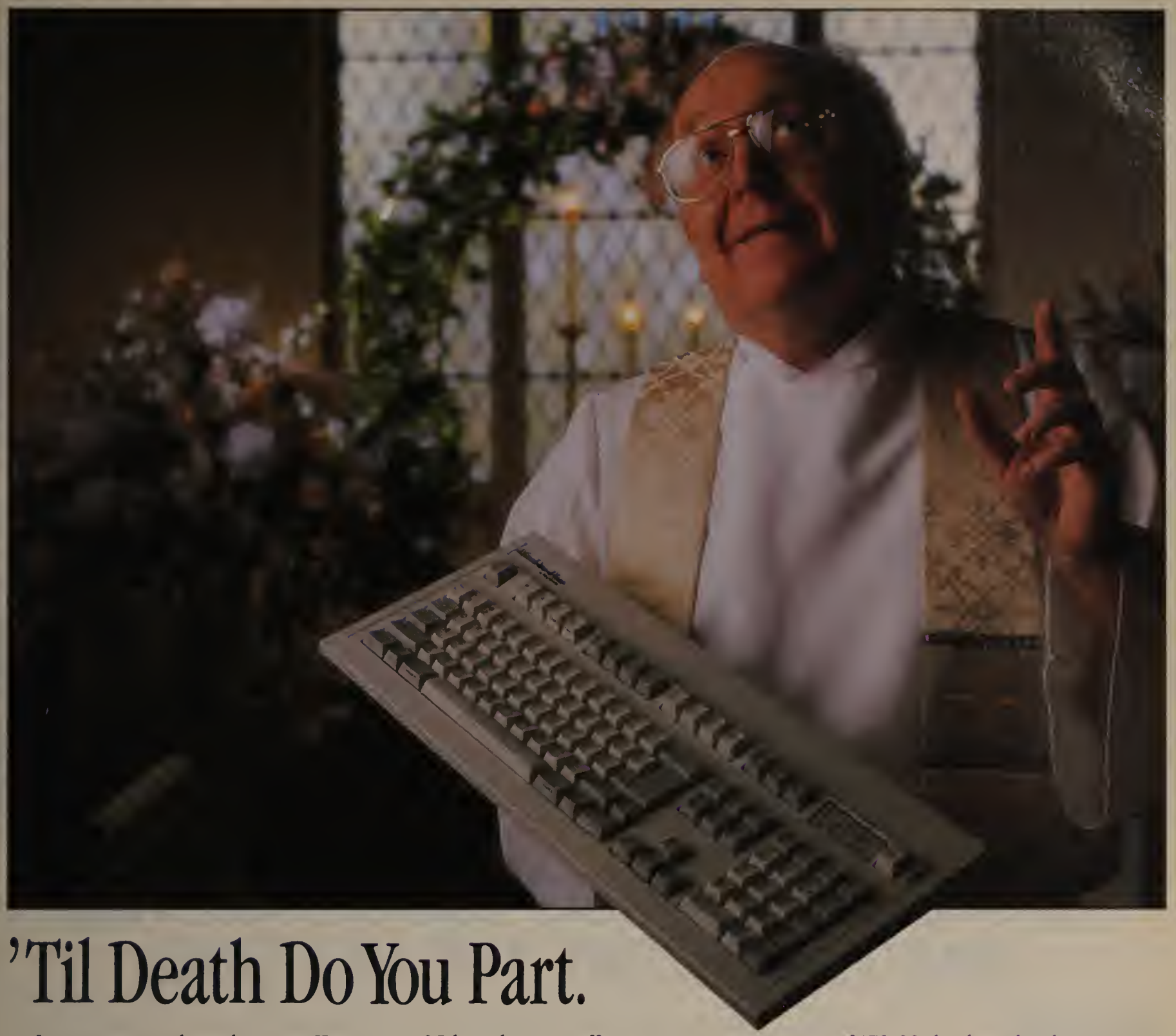
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LETTERS



Under Apple's Thumb

The crucial argument against choosing a Mac instead of a PC ["Mac vs. PC," March 1991] is that this violates the principle of diversification. You put the future of your computing success in the hands of one single erratic, unstable company—Apple. Contrast this with the many sources of hardware for PCs, and the wisdom of choosing a PC is plain.

David Herron
Atherton, California

Cheapest Is Best

Sculley's Apple lacks the revolutionary vision of Steve Jobs. With MS-DOS moving toward the Mac interface, high-resolution graphics standards being set by the VGA and XGA, and MS-DOS's preeminence in the marketplace, the Mac's future looks uncertain unless its price/performance ratio competes directly with that of the IBM clones. Lack of true bus-type expansion slots in a majority of Macs makes expansion expensive. Apple computers depreciate strikingly with each new successor system released, whereas the original IBM PC is still viable today. Where are the 128K Macs or even the Fat Macs?

Every machine finds a niche as a result of its applications and user preference. However, a reliable personal computer for text, graphics, or sound applications can be assembled with an MS-DOS machine at costs lower than a comparable Macintosh. Unless price is not an object, the Mac's user friendliness remains a costly luxury.

Marvin Gozum
Philadelphia, Pennsylvania

MacExpansive

Jim Heid suggests that many Macintosh models have limited expansion capabilities, but he fails to mention that the Macintosh generally requires less expansion than a PC because it has more capabilities built in.

Second, the article ignores the simplicity of Macintosh networking, suggesting that a lower-cost PC networking card is more important than the ease of providing Mac network services. Many companies use the supposed lack of attention by 3Com and Novell as an excuse to ignore the Mac, but we've built a corporate AppleTalk network with services far beyond those offered to our PC users.

Give the Macintosh credit where credit is due. Its expansion capabilities and networking flexibility are greater than you think.

Scott Joy
Rollinsford, New Hampshire

Windows: Not for the Novice

Jim Heid's statement that a power user might want to buy a Mac whereas a casual user should get a Windows machine is ludicrous. If you are a power user and you are content to operate with 8-bit color (VGA), a single hard drive under 300MB, no sound, one monitor, problematic acceleration, and/or central processing unit updates, hardware conflicts, and an operating system that will

(continues)

Corrections

*The Upfront picture (*Macworld News, *March 1991) should have been credited to Scott Frances/Esto.*

The price per page for an A-size print on the Hewlett-Packard Paintwriter XL ("Color Printers Here and Now," February 1991) is 22 cents to 27 cents when the page is 15 percent filled with ink.

The correct price of Alliance Peripheral Systems' APS-45R ["Expansion Made Easy," May 1991] is $479.

*The Windows, OS/2, and Macintosh versions of Microsoft Excel 3.0 (*Commentary, *April 1991) have the same feature set, but in the Mac version, some features require System 7.0.*

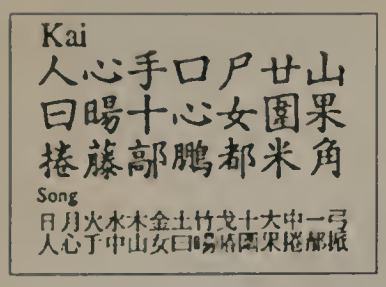
*The correct price for SampleCell with 8MB of RAM is $2995 (*New Products, *April 1991).*

*Canvas 3.0 (*Macworld News, *April 1991) supports leading type by 1/100 point and tracking by 1/2 point; it can combine more than two objects in a single blend; and it provides 17 standard engineering and architectural patterns and lets users add an unlimited number of new ones.*

*It is impossible to eject the cartridge from the Microtech R50's Ricoh removable drive (*Reviews, *February 1991) while it is spinning, due to a safety latch on the eject button*

(continues)

WARD SCHUMAKER



*The image printed with the MacChinese Taiwan font set (*New Products, *April 1991) showed the default character set, not Chinese characters. See the correct MacChinese Taiwan font set above.*

*For current subscribers, the price of CompuServe Information Manager 1.03 (*Reviews, *December 1990) is $24.95 and includes a $15 usage credit. CompuServe Information Manager is free to new members with the CompuServe Membership Kit, which costs $39.95.*

. . . . . .

be undergoing radical changes in order to implement features that for the most part already exist in the Mac—go with it. You are either a technology freak or like the rest of us, you are just trying to fit into Bill Gates's brave new world.

Cyrus Salam
Oakland, California

Hacker Pride

As for the Steve Jackson Games article, I am more appalled now than when I originally read the news accounts of the case in March. As a hacker and a programmer, I am completely appalled at the lack of respect that computer programmers, users, and hackers get. Face it, folks, hackers are actually a good thing. We make your system administrators aware of security holes and make them do their jobs.

We hackers are an inconvenience; we are not a true threat. For our government to allow this kind of fifties-mentality ransacking of a business is unconscionable.

Stephen Bobic
Oak Ridge, Tennessee

Hackers: Not Publishers

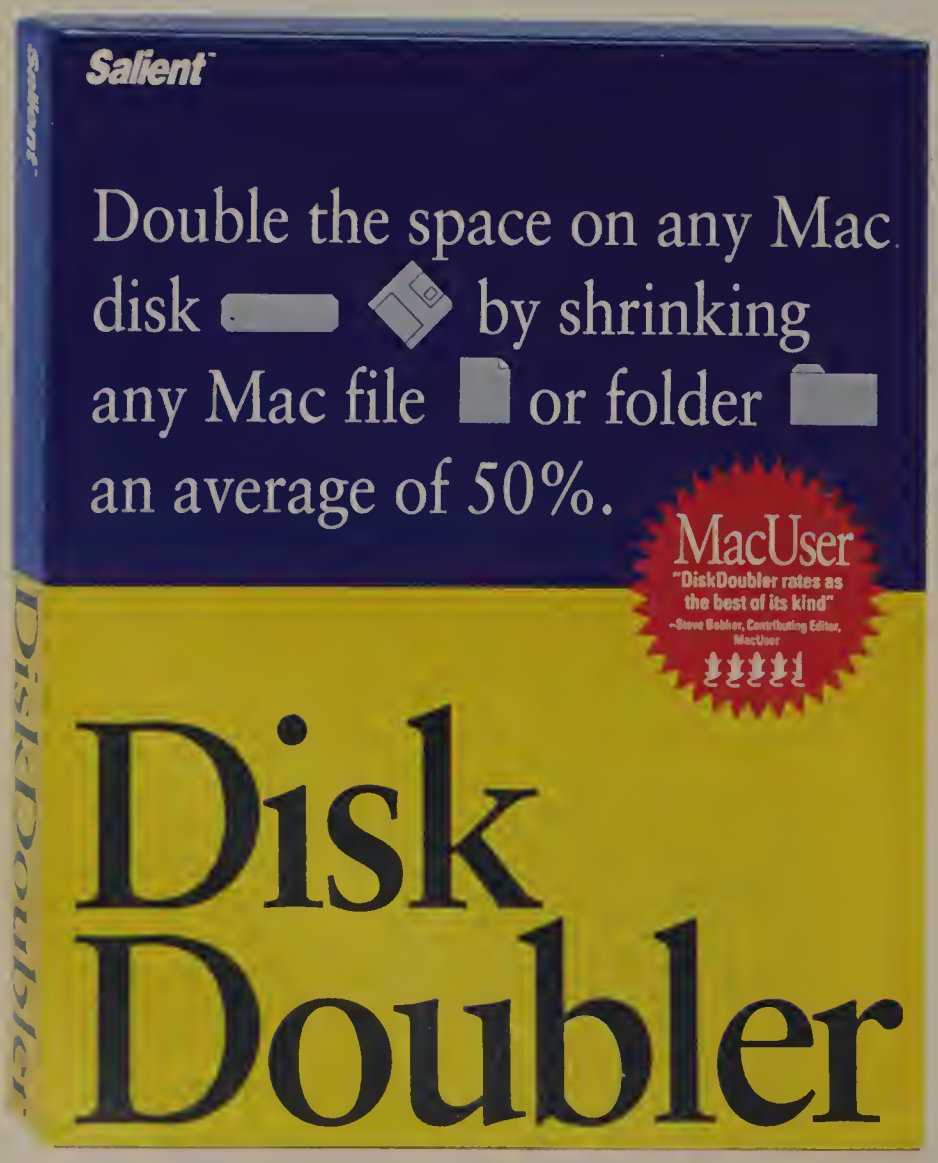
I read Steven Levy's piece "Search and Destroy" [*The Iconoclast,* March 1991] with some interest, and I cannot resist commenting on it.

Now let's see if I got it straight. At some length following tedious legal procedures Steve Jackson learned the cause of this outrage [a search by the United States Secret Service] was the indisputable fact that one of Mr. Jackson's employees, a certain Loyd Blankenship, is a member of the Legion of Doom, a fellowship devoted to screwing around inside other people's computers. The notion that any jackass who claims he runs a bulletin board and is therefore a *publisher* entitled to some special protection will be hard to get off the ground.

If you folks are really determined to wave the flag about *something* in this case, it might well be to determine to what extent employers in our society are and should be made responsible for the acts of their employees.

Leland Campbell
San Mateo, California

(continues)



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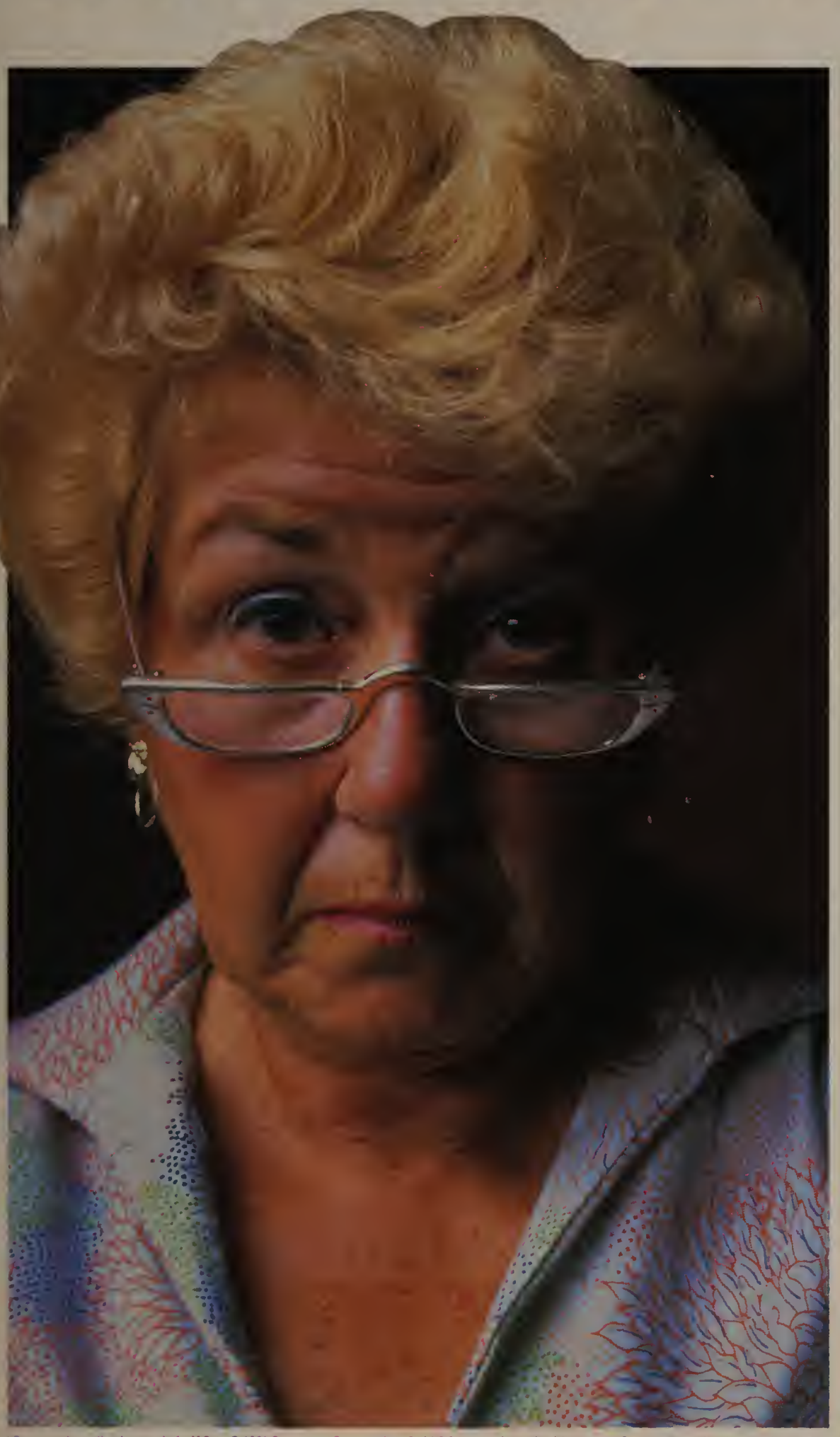
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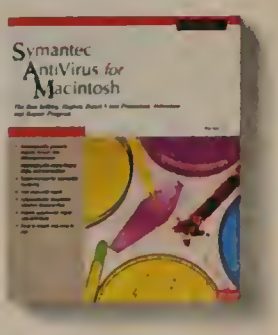
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Electronic Frontier Foundation Connection

Steven Levy's wonderful column deserves honorable mention for bringing the Steve Jackson fiasco to the public eye. However, Levy failed to mention that the Electronic Frontier Foundation (EFF), which is devoted to protecting civil rights related to computers, can be reached online through a San Francisco computer system called the WELL, the Whole Earth 'Lectronic Link. The easiest way to reach the WELL is via any CompuServe node. Dial your local CompuServe number and when you get a HOST NAME: prompt, type **WELL** and press the return key to sign up.

Alex Whitney
New York, New York

The Flight of the Hard Drive

I am writing in response to "Cloud over SyQuest" [*Macworld News*, February 1991]. We have been using SyQuest removable hard drives, assembled by PLI, for the last two years. Each evening for the past two years, I have removed the cartridge from the hard drive, inserted it in the plastic carrying case, and tossed it several feet across the office to my open briefcase. Most of the time it lands in the briefcase, although occasionally it hits the floor and skids across the room before knocking into the wall. I follow this same procedure at home.

Our PLI-SyQuest drives and cartridges have worked flawlessly for the last two years. However, I must say that the cartridge's aerodynamic performance does deteriorate at distances greater than 15 feet.

William Neidig
Sunnyvale, California

Where's DesignStudio?

For the *n*th time I find an article about DTP ["Page Wars," February 1991] that ignores one of the best DTP packages I know about—Letraset DesignStudio. DesignStudio is proven to be much better than PageMaker in most categories, even by your own tests. Check the table on pages 294–295 in your May 1990 issue. Feature by feature, DesignStudio beats PageMaker and in fact, matches up to QuarkXPress pretty good too.

Thomas Garcia
via CompuServe

Macworld occasionally selects significant products in specific application areas for head-to-head comparisons. For an overview of all page-layout programs, the May 1990 article you cite should prove most helpful. In this case we chose PageMaker and QuarkXPress based on their installed user base.

On Recycling Macworld

I was reading through the March 1991 issue of *Macworld* and came across an ad that turned my stomach. On page 110, I find an ad titled "How to recycle your *Macworld* magazine." It seemed harmless enough, but after reading it and thinking about it for a few moments two thoughts came to my mind. First, I found this to be a simple advertising stunt, at

(continues)

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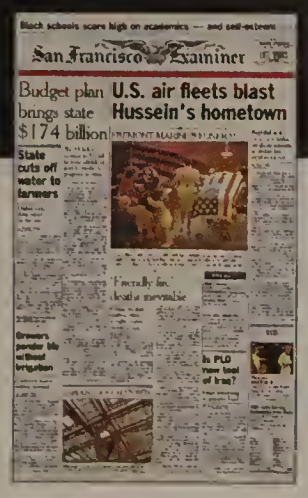
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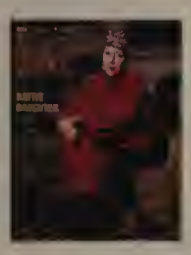
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the expense of the environment, to increase the circulation of *Macworld* by suggesting readers "pass it on" to prospective subscribers. Second, I find it hard to swallow the Macworld Earth Conservancy line when in this very same issue I counted six pieces of paper trying to sell me a subscription to *Macworld*.

Scott Czadzeck
Fremont, California

Squeezing Up a Storm

I enjoyed reading Charles Seiter's article on compression technology ["The Big Squeeze," January 1991]. However, I'd like to clear up a couple of points.

First, the Colorsqueeze package from Kodak is based on an adaptive DCT algorithm, as JPEG is, but Colorsqueeze does not create JPEG-compatible files. Second, the article gives the impression that C-Cube's Compression Master board is also JPEG-compatible. The only C-Cube board shipping at this time is based on the CL550A chip.

Adriaan Ligtenberg
Founder, Storm Technology
Palo Alto, California

. . . . . .

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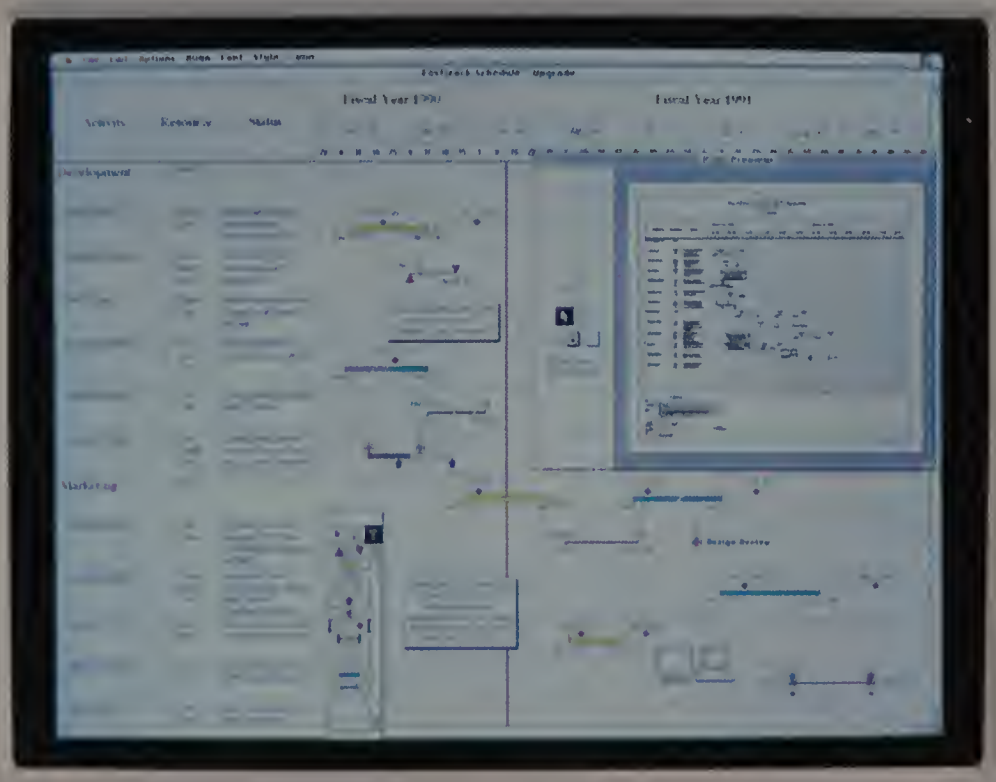
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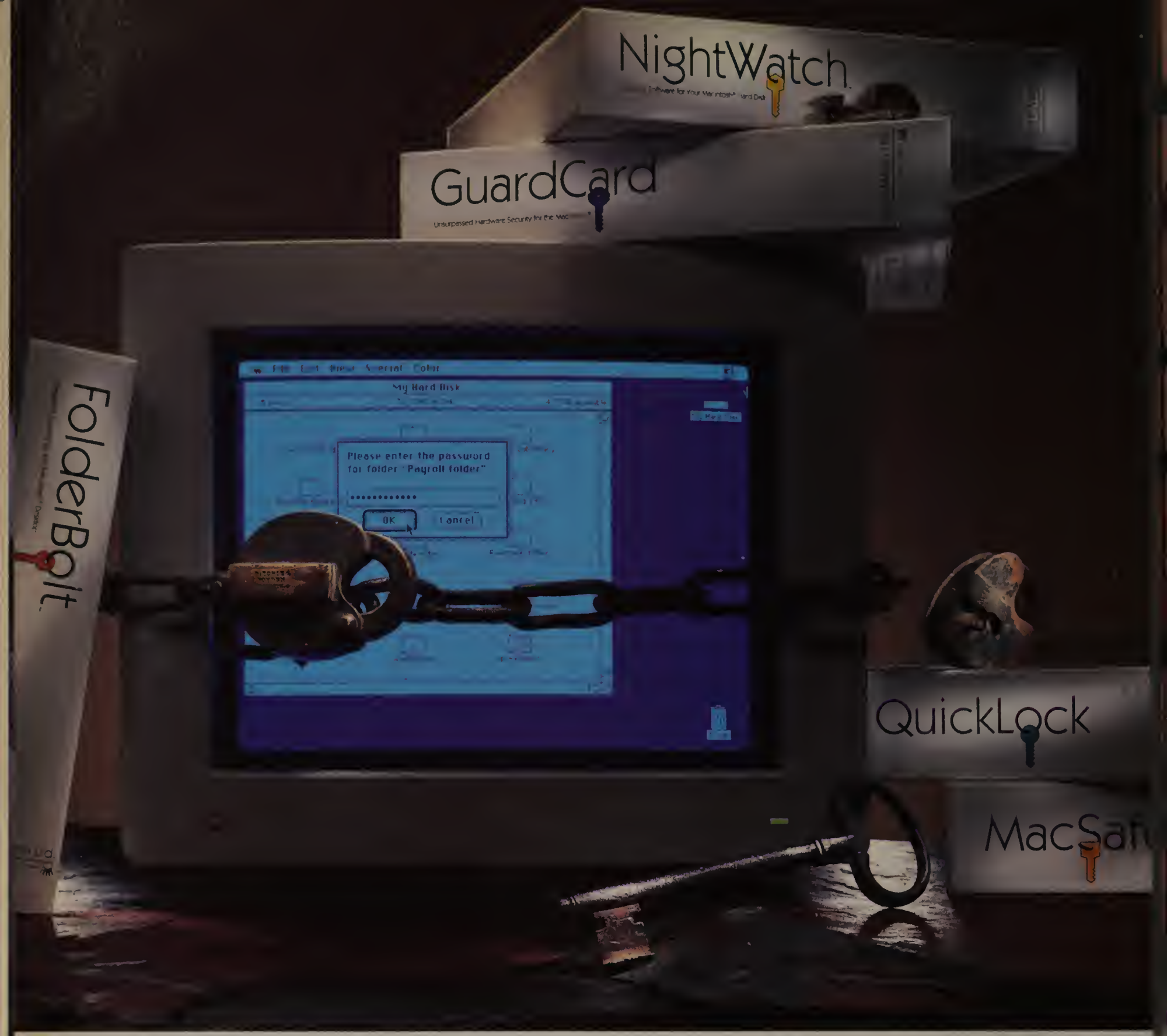
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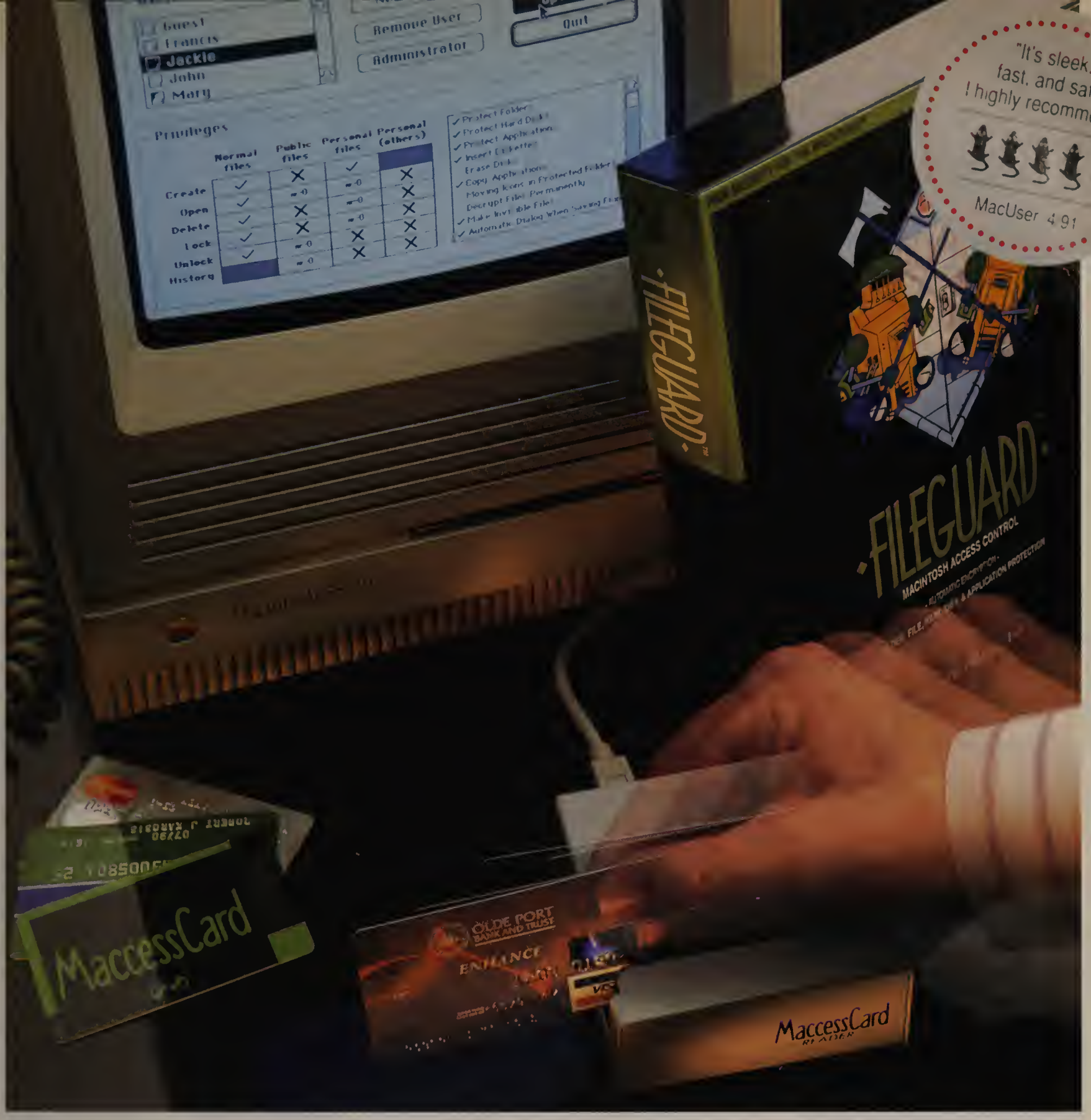
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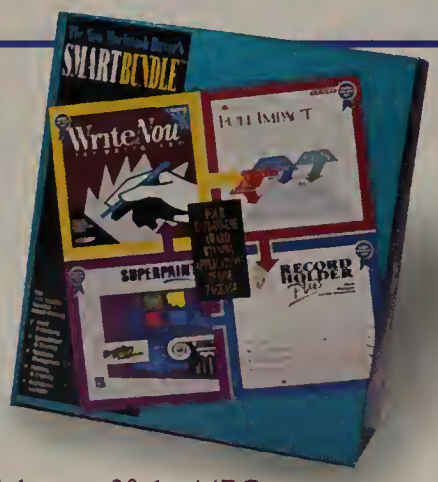
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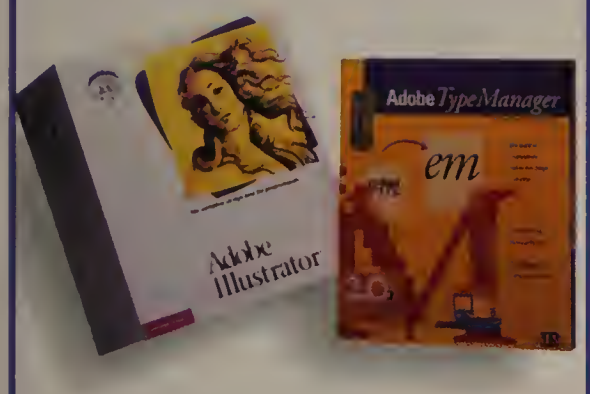
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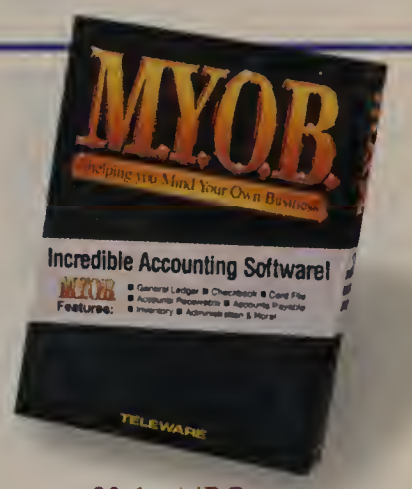
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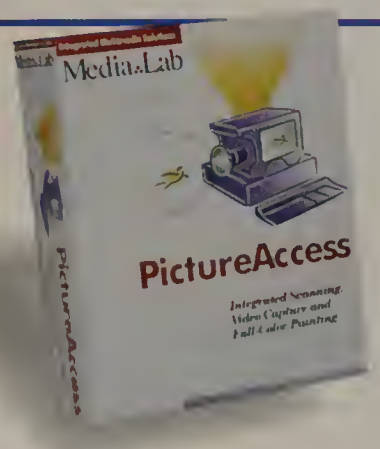
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8180 Faces . . . . . 25.
Falcon 2.2 or Vette 1.0 . . . . . ea. 33.
★Spinnaker ... 30 day MBG
2328 Sargon IV *(CP) (chess)* . . . . . 28.
★Strategic Studies ... 30 day MBG
8084 Halls of Montezuma . . . . . 26.
8085 Panzer Battles. . . . . 26.
StudyWare
ACT, GMAT, GRE, or SAT Prep . ea. 29.
8098 LSAT Prep for the Mac . . . . . 35.
★Terrace Software ... 30 day MBG
8192 Mum's The Word *(gardening)* . . . . . 79.
★Toyogo ... 30 day MBG
7624 Nemesis Go Master 4.7. . . . . 41.
7623 Nemesis Go Master Deluxe 4.7. . . . 85.
★Voyager ... 30 day MBG
Amanda Stories *(vol. 1, 2 or 3)* . ea. 18.
★XOR ... 30 day MBG
8061 MacSki 1.01 . . . . . 39.
6040 MacGolf Classic 1.0 *(CP)* . . . . . 52.

NETWORKS & COMMUNICATIONS

★Abaton ... 30 day MBG
6266 InterFax 24/96 Modem . . . . . 349.
Applied Engineering
8365 DataLink Express . . . . . 175.
DataLink/Mac or Mac Portable ea. 209.



CE Software ... 60 day MBG
QuickMail 2.2.3–Power & ease of use have made QuickMail one of the leading E-mail systems for the Mac, with over 350,000 users worldwide. Free upgrade to QuickMail 2.5 *(available this summer)*. 5174 *5 Pack*. . . . $215. 5173 *10 Pack*. . . . $315.

8938 DataLink LC . . . . . 265.
8362 QuadraLink . . . . . 209.
★Baseline Publishing ... 30 day MBG
8943 DoubleTalk *(1 Pak)* 79. 8942 *(2 Pak)* 129.
★Beagle Bros. ... 30 day MBG
7691 Flash 1.1. . . . . 125.
★CE Software ... 60 day MBG
5174 QuickMail *(5 Pak)* 215. 5173 *(10 Pak)* 315.
★CompuServe ... 60 day MBG
1676 Macintosh Membership Kit 1.03 . . . 22.
1673 CompuServe Navigator 3.0 . . . . . 49.
1674 Membership Kit/Navigator Bundle . 68.
★DataViz ... 60 day MBG
1823 MacLink Plus/PC 5.0 . . . . . 129.
4842 MacLink Plus/Translators 5.0. . . . . 109.
Dayna Communications
DaynaTALK *(5 Pak)* 379. *(10 Pak)* 689.
8719 EtherPrint . . . . . 349.



Int'l. Bus. Software ... 30 day MBG
8581 *DataClub 1.1 (3 user)*–Amazing new concept in file server software. Provides parallel processing performance, centralized server access, and practically unlimited storage–yet requires no dedicated hardware. Simply outstanding! $199.

290C

MMC

1-800/334-4444

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Unlimited Toll-Free Technical Support.

We'll ship what you



Freesoft ... 60 day MBG

6115 *White Knight 11*–A 10 award winning communications program, that supports XMODEM, YMODEM, ZMODEM, Kermit, and CompuServe Error Correcting protocols. Includes Okyto 1.0 and a free subscription to GEnie **$85.**

★Dove Computer ... 60 day MBG

6758 DoveFax Desktop 1.1.1 ..... 295.
9634 DoveFax+ ..... 359.

★Dow Jones ... 30 day MBG

5295 News/Retrieval Membership Package 24.

EveryWare

8077 AllShare 1.1.4 ..... 139.

★Farallon Computing ... 30 day MBG

9805 Timbuktu 4.0 *(April-May '91)* ..... 136.
4866 Timbuktu/Remote 2.01 ..... 135.
6371 Timbuktu/Remote Access Pack .. 925.
8707 Liaison 3.0 ..... 279.
6273 PhoneNET StarConnector 10-Pack. 129.
4869 PhoneNET Connector 10-Pk *(DIN-8)* 198.
2206 PhoneNET StarController 300 .... 899.
6687 PhoneNET StarController-EN .... 1739.
6766 MediaTracks ..... 189.
6768 MediaTracks Multimedia Pack .... 319.

★Freesoft ... 60 day MBG

6115 White Knight 11 ..... 85.

★Global Village ... 30 day MBG

8946 TelePort A300 ..... 139.
8945 TelePort/FAX ..... 169.

Hayes

2300 Smartcom II 3.2 ..... 84.
2307 Smartmodem 2400 ..... 349.
7391 Ultra 9600 Modem ..... 799.

Insignia Solutions

7557 Access PC 1.1 ..... 62.
7058 SoftPC-AT/EGA Module ..... 124.
4089 SoftPC 1.3 ..... 245.

Intel Corporation

5119 2400EX Modem ..... 179.
6420 2400EX MNP Modem ..... 229.
8193 9600EX Modem *(w/QuickLink II)* .. 549.

★Int'l Business Software ... 30 day MBG

8581 DataClub 1.1 *(3 user)* ..... 199.
8580 DataClub 1.1 *(10 user)* ..... 539.

★Kennect Tech. ... 30 day MBG

5631 Rapport 1.3.4 ..... 195.
7588 Drive 360 *(5¼")* ..... 249.
7590 Drive 1200 *(5¼")* ..... 249.
5632 Drive 2.4 *(3½") (incl. FastBack II)* . 325.

★Microcom ... 30 day MBG

7465 CarbonCopy Mac *(Twin Pak) special* 139.
8027 MacModem V.32 ..... 689.

★Microsoft ... 30 day MBG

0444 Microsoft Mail 3.0 *(1-5 user)* ..... 269.

★Nuvotech ... 60 day MBG

3000 TurboNet ST *(DIN-8)* ..... $30.
6272 NuvoLink SC ..... 389.

★Orchid Technology ... 30 day MBG

6949 OrchidFAX Modem 1.06 ..... 419.

★Practical Peripherals ... 30 day MBG

3102 2400 Baud External Modem ..... 179.
8994 2400 V.42 bis Modem ..... 209.
7934 PM9600SA Modem 1.26 ..... 489.
3089 Mac Communications Pack ..... 225.

★Prometheus ... 30 day MBG

8350 2400 Mini for Mac ..... 149.
8348 24/96 Minifax ..... 189.
8349 Maxfax ..... 289.
8709 2400M Plus ..... 219.
8738 9600M Plus ..... 599.
8990 ProModem Ultima ..... 689.

★Shiva ... 30 day MBG

3444 NetSerial 3.3 ..... 275.
NetBridge or TeleBridge .... ea. 409.
3443 NetModem V2400 3.3 ..... 339.
6917 NetModem V.32 *(V.42 & V.42 bis)*. 1169.
6519 EtherGate ..... 1619.
8189 FastPath IV ..... 1889.



Farallon Computing ... 30 day MBG

9805 *Timbuktu 4.0*–This new version of the leading remote control software now supports color and provides clipboard exchange and full background file transfer. Also has multiple window capability ..... **$136.**

Sitka/TOPS

4188 TOPS Teleconnector *(DIN8)* ..... 23.
3720 TOPS Flashcard ..... 155.
6264 TOPS Networking Bundle 3.0 .... 187.

★Software Ventures ... 30 day MBG

3455 MicroPhone II 3.0 ..... 215.

★Solutions, Inc. ... 60 day MBG

6720 FAXGATE Plus 1.1.2 ..... 239.

★Synergy ... 30 day MBG

6618 VersaTerm 4.5 ..... 87.
6619 VersaTerm-PRO 3.5 ..... 173.

★Traveling Software ... 60 day MBG

3729 LapLink Mac III Connectivity Pac .. 93.

INPUT/OUTPUT

★Abaton ... 30 day MBG

7432 Scan 300/GS *(reqs. Scan Kit)* .... 999.
Includes free ProPoint ($79 value).

American Power

5895 UPS 110SE ..... 209.
6686 UPS 370ci ..... 339.

Apple Computer

9771 StyleWriter & Ink Cartridge ..... 559.



Baseline Publishing ... 30 day MBG

7784 *Color MacCheese 1.05*–Affordable 32-bit color painting. Perfect for the Mac LC ... **$56.**
7785 *Talking Moose 3.0*–Jokes, humor & more 23.
8055 *Screenshot 1.2*–The one-step screen graphics solution ..... 30.

Applied Engineering

9799 Cache-In ..... 199.

Caere

8124 Typist ..... 479.
4476 OmniPage 2.12 ..... 495.
OmniSpell 1.0 or OmniDraft 1.0 ea 69.

CH Products

7344 Rollermouse ADB ..... 75.

Chinon

8814 DS-3000 Scanner w/Dig. Darkroom 699.
8815 DS-3000 Scanner w/OmniPage .. 1069.

Computer Friends

8271 ColorSnap 32+ ..... 649.

★CoStar ... 30 day MBG

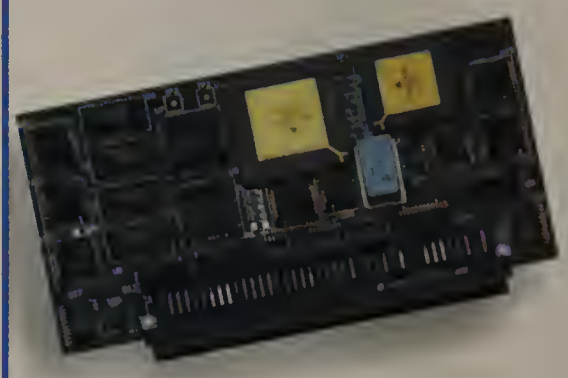
6090 LabelWriter ..... 179.
7452 LabelWriter Labels *(12-Pak)* ..... 49.

★Datadesk ... 30 day MBG

6901 Switchboard *(modular keyboard)* . 159.

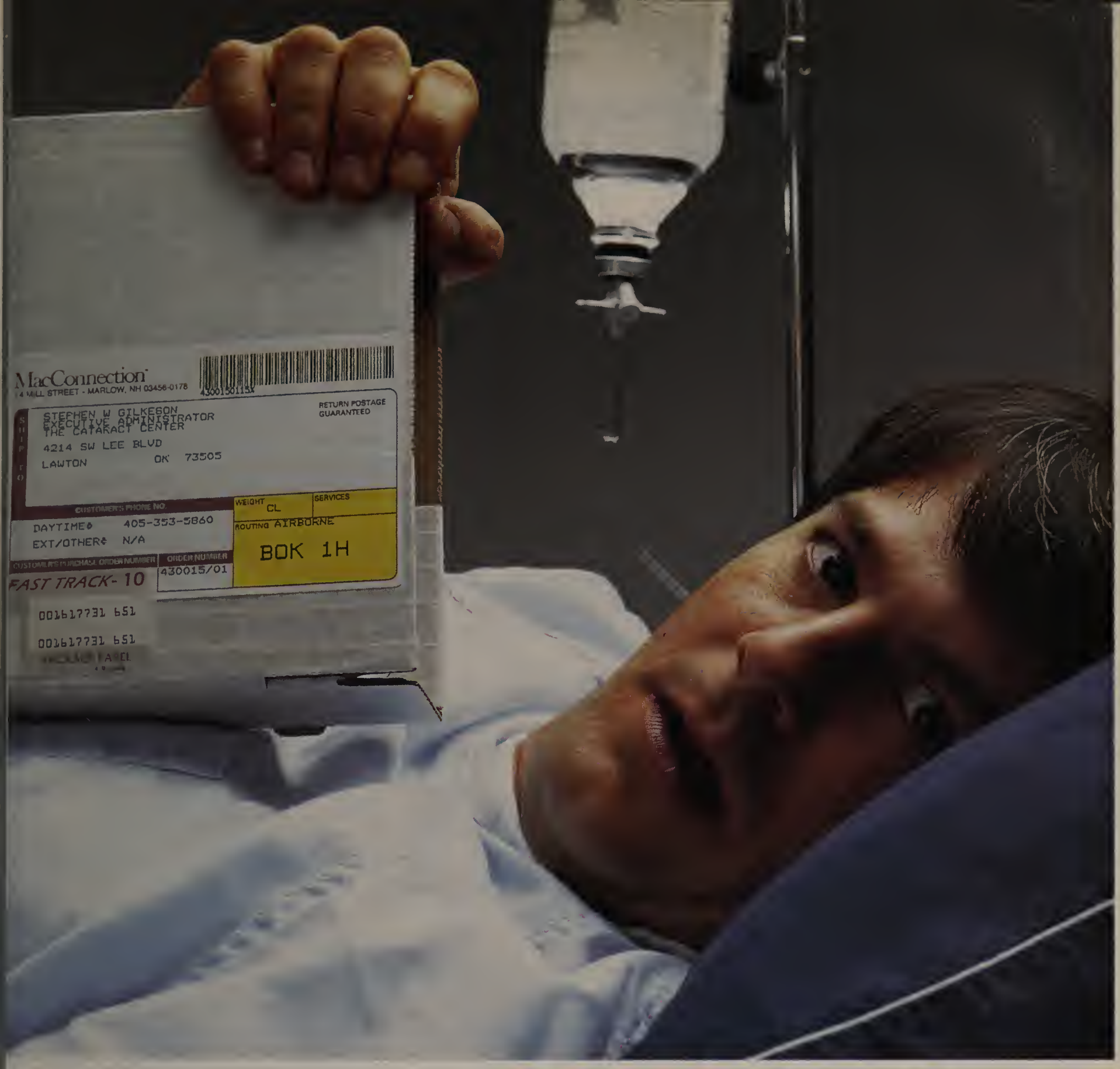
★DayStar Digital ... 30 day MBG

Listed items do not include coprocessor.
LT200 Connection *(PC) 189. (MC)* 299.
8556 FastCache for Mac IIci ..... 279.
8586 40 MHz PowerCache IIci ..... 949.
8585 50 MHz PowerCache IIci ..... 1689.
8583 SCSI PowerCard ..... 1095.



DayStar Digital

PowerCache IIci–Go faster than a Mac IIfx! New 40 and 50 MHz turbocharged cache cards for the Mac IIci. Turns your computer into the fastest Mac alive! ... **see line listing.**



"Fast deliveries may require immediate medical attention."

Dear MacConnection,

As a large outpatient surgical center, our doctors and nurses are trained to handle medical emergencies. Fortunately, they were able to stabilize my vital signs when I received software from you after only 12 hours! Last night at 11:00 I placed an order. I was totally overwhelmed when it arrived on my desk before 10:30 this morning. Once again you have proven to me that your company is the best in the business. One suggestion, though. Maybe you can place a label on the shipping container that says, "WARNING: Fast deliveries may require immediate medical attention."

Stephen W. Gilkeson
The Cataract Center of Lawton, OK

1-800/334-4444

MacConnection®

MacConnection, 14 Mill Street, Marlow, NH 03456 603/446-7711 FAX 603/446-7791

Just for the record, all the ads in this series feature photographs of real live MacConnection customers and the real live letters they wrote us Really!

need in a flash.

25 MHz PowerCard 030 *(II,IIx,IIcx)* ea. $1095.
40 MHz PowerCard 030 *(II,IIx,IIcx)* ea. 1389.
50 MHz PowerCard 030 *(II,IIx,IIcx)* ea. 1895.

★Dove Computer ... 60 day MBG

Marathon Racer 030 Plus or SE ea. 599.
9789 Marathon Racer 030 II . . . . . 1079.

GDT Softworks

6256 PrintLink Collection 4.0 . . . . . 59.
6151 JetLink Express 2.1 . . . . . 89.
8960 ParaLink Express . . . . . 99.

Hewlett-Packard

6514 HP DeskWriter Printer . . . . . 759.
6754 HP LaserJet III *(with toner)* . . . . . 1699.
9355 HP LaserJet IIP *(with AppleTalk, 1 Meg & PostScript Cartridge)* . . . 1799.

Hitachi

9492 14" Color Monitor *(includes 15-pin adaptor for Mac II)* . . . . . 599.

★Kensington ... 30 day MBG

Turbo Mouse 3.0 *(Plus or ADB)* ea. 107.

Kodak

6730 DICONIX M150 Plus Printer . . . . . 399.

★Kraft Systems ... 60 day MBG

7519 KM30 ADB Joystick . . . . . 42.

★Logitech ... 30 day MBG

5082 ScanMan Model 32 G-Scale Scanner 299.



MegaGraphics
19" Rival Monochrome System for SE, SE/30 or II–Macworld Editors' Choice in large screens. Also includes coupon book with over $3000 in savings on special 3rd party products. **ea. $1199.**

MegaGraphics

16" 8-bit System for SE/30 or II ea. 2595.
7841 16" 24-bit Color System for Mac II 4895.
19" Rival Sys. SE, SE/30, or II . ea. 1199.
19" 8-bit System for SE/30 or II ea. 4295.
7840 19" 24-bit Color System for Mac II 6395.
19" G/S System for SE/30 or II ea. 1895.

★Micron ... 30 day MBG

7149 Xceed IIci-128 Cache Card . . . . . 239.
6680 Xceed for SE/30 *(640 x 480)* . . . . . 329.

★MicroSpeed ... 30 day MBG

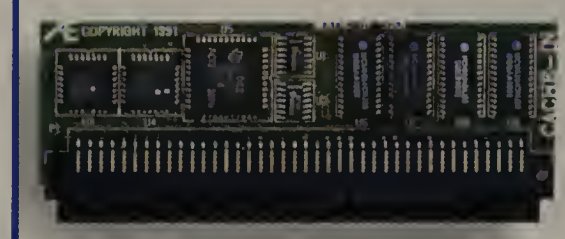
6620 MacTRAC . . . . . 59.
6621 MacTRAC ADB . . . . . 69.

★Mouse Systems ... 30 day MBG

7560 Trackball ADB . . . . . 68.
Little Mouse or Little Mouse Plus . ea. 74.
9471 A³ Mouse . . . . . 85.

★Nutmeg Systems ... 30 day MBG

15" Monitor: SE, SE/30, II or IIsi ea. 599.
19" Monitor: SE, SE/30, II or IIsi ea. 995.
Monitor: G-Scale SE/30, II, IIsi ea. 1295.
Color System: SE/30, II, IIsi ea. 2595.



Applied Engineering
9799 Cache-In–Cache-In on IIci performance with Applied Engineering's cache card. Cache-In gives your Mac IIci increased speed of up to 40% with high reliability, low power consumption and low price . . . . . **$199.**

★Orange Micro ... 30 day MBG

3036 Grappler 2.0 *(9 pin)* . . . . . 92.
6229 Grappler LX . . . . . 134.

Pacific Data Products

7412 Pacific Page PE 4.0 for the Mac . . 529.

Passport Designs

3115 MIDI Interface . . . . . 75.
9508 MIDI Cables *(Qty. 2)* . . . . . 12.

RasterOps

8526 Video Expander . . . . . 529.
7469 ColorBoard 264 for SE/30 . . . . . 679.
8944 RasterOps 24STV . . . . . 1299.
Business Color System: SE/30 or II 2995.

★Sophisticated Circuits ... 30 day MBG

8009 PowerKey 64. 8008 Wake-Up Cable 32.

TheCompiete PC

6104 Half-Page Scanner/400 . . . . . 289.

Thunderware

4994 LightningScan 400 . . . . . 385.

★Total Systems ... 30 day MBG

8653 Galileo I Video Board *(for Mac SE)* 449.
9282 Galileo I Video *(for Mac Plus)* . . . . . 449.
8989 High Speed SCSI for Mercury 16+ 189.
7817 16 MHz Mercury 030 *(for Mac SE)* 389.
8624 16 MHz Mercury 030 *(for Mac Plus)* 519.



Prometheus ... 30 day MBG
8990 ProModem Ultima–The only 14,400 bps (V.32bis) modem with 9600 bps send/receive fax capability and all the software you need. Ideal for use with remote access programs like Timbuktu/Remote . . . . . **$689.**

7816 20 MHz Gemini 030 . . . . . $799.
8708 25 MHz Gemini 030 w/o copro. . . 1179.
7814 33 MHz Gemini II 030 . . . . . 1375.
8371 40 MHz Gemini II 030 . . . . . 1499.

MEMORY & DRIVES

SIMMs ... 2 year warranty

Includes free instructional video tape.

1107 1 Meg SIMMs *(80ns)* . . . . . 57.
8316 2 Meg SIMMs Set *(80ns)* . . . . . 99.
9437 2 Meg SIMM for IIsi *(2 - 1 Meg SIMMs)* call
7497 1 Meg SIMMs for IIfx *(set of 4)* . . . . 239.

Applied Engineering

8362 QuadraLink . . . . . 205.
8361 1.44 Meg High Density Drive . . . . 229.
MacRam Classic with 0, 1, or 3 Mb. call

★Cutting Edge ... 30 day MBG

3989 800K External Disk Drive . *special* 119.
5133 20+ Meg Hard Drive . . . . . 329.
3990 30+ Meg Hard Drive . . . . . 389.
3991 45+ Meg Hard Drive . . . . . 439.
5275 60+ Meg Hard Drive . . . . . 489.
5276 80+ Meg Hard Drive . . . . . 529.
5456 45 Meg Removable Drive . . . . . 599.
5736 45 Meg Removable Cartridge . . . . . 79.



Cutting Edge ... 30 day MBG
3989 800K External Disk Drive–Low cost, reliable 800K external floppy drive. Reads both 400K and 800K disks; includes eject button and busy light. A great drive at a great price! . . . . . **$119.**

Dayna Communications

8723 DaynaFILE 360k Drive . . . . . 449.
8722 DaynaFILE 1.2 5¼" Drive . . . . . 449.
8724 DaynaFILE Dual 360k & 1.44 Mb . 739.

★Dove Computer ... 60 day MBG

MaraThon 030 Upgrades . . . ea. 399.
8186 MacSnap 524XE . . . . . 199.
8187 MacSnap 524XS *(w/SCSI Port)* . . . . 249.
8649 MacSnap 596XE *(4 Mb)* . . . . . 299.
8652 MacSnap 596XS *(4 Mb w/SCSI Port)* 365.

★Fifth Generation ... 30 day MBG

9809 FastBack Tape . . . . . 999.
9403 JukeBox Five *(auto disk feeder)* . . . 155.

Iomega

7551 44 Meg Transportable *(reqs. kit)* . . 929.

Peripheral Land, inc. (PLI)

8335 PLI TurboFloppy 1.4 . . . . . 309.
8334 PLI SuperFloppy . . . . . 429.
8333 PLI Sony 40 Turbo Ext. Drive. . . . . 439.
8327 PLI Infinity 40 Turbo . . . . . 739.
8330 PLI 105 Meg Ext. Drive . . . . . 699.
8329 PLI 200 Meg Ext. Drive . . . . . 1179.

Overnight. $3.



Cutting Edge ... 30 day MBG

Cutting Edge Hard Drives are fast and reliable with access times as low as 23 milliseconds and a mean time between failure rating of up to 100,000 hours. An outstanding combination of quality and low price. . . . . **see line listing.**

Quantum

40 Meg & 80 Meg Internal Drives for Mac SE, SE/30, IIx, IIfx, IIci & IIcx . . call

★Total Systems ... 30 day MBG

68882 Math Coprocessors . . . . . call

ACCESSORIES

Apple Computer

7748 Personal LaserWriter Toner Cart. . . . 89.
1115 LaserWriter II Toner Cartridge . . . . 105.

★Avery ... 60 day MBG

4807 Laser Labels 1" x 2⅝" *(Qty. 3000)* . 24.
5392 Disk Labels 3½"-*Laser (Qty. 630)* . . 29.

★Basic Needs ... 60 day MBG

Nylon Dust Covers. . . . . 10. to 13.
7413 Mac IIcx/ci Monitor Stand . . . . . 48.

★Computer Coverup ... 60 day MBG

9501 Mac LC w/12" Monitor Cover . . . . . 10.
1725 Mac SE Ext. Keyboard Cover set. . . 10.

★CoStar ... 30 day MBG

7453 The Organizer Jr. . . . . 82.
6091 The Organizer. . . . . 199.

★Curtis Manufacturing ... 30 day MBG

8046 MVP Mouse . . . . . 89.



Insight Development ... 30 day MBG

6171 *MacPrint 1.23*–Lets you use any HP printer with your Mac. For a limited time, buy MacPrint 1.23 and get MacEnvelope 4.2, an envelope printing utility, absolutely free . . **$93.**

★Goldstein & Blair ... 30 day MBG

8198 "What Do I Do Now" Book. . . . . $9.
8374 The Macintosh Bible *(w/disk)* . . . . . 25.
9283 The Macintosh Bible/"What" Bundle 30.

★I/O Design ... 30 day MBG

Available in black (listed) or blue.

8812 Ultimate Classic Carrying Case. . . . 64.
6129 Ultimate SE/Ext. Carrying Case. . . . 79.

★Kensington ... 30 day MBG

Full line available. Partial listing.

2559 Apple Security Kit . . . . . 33.
9303 Keyboard Shelf . . . . . 39.
6763 SE Radiation/Anti-Glare Filter . . . . . 52.
2566 System Saver Mac *(platinum)* . . . . . 63.
5064 Apple Color Monitor Polarizing Filter 63.
PassProof *(specify right or left)* . . . . 65.

★MacConnection ... 60 day MBG

4623 Solid Oak Disk Case *(holds 90 disks)* 32.
8795 Switch Box *(2 Pos.)* 32. 8796 *(4 Pos.)* 49.

★Moblus Technologies ... 60 day MBG

4470 Fanny Mac QT *(Platinum)* . . . . . 53.

★Moustrak ... 60 day MBG

2694 Moustrak Pad *(7"x9")* 8. 2692 *(9"x11")* 9.
2693 Moustrak Pad L/F *(large 9" x 11")* . . 10.



Custom Applications ... 30 day MBG

8037 *Freedom of Press Light 3.0*–Print PostScript text & graphics files on non-PostScript printers. This award-winning software includes 17 outline fonts & supports ATM & Type 1 fonts. . . **$55.**
6517 *Freedom of Press 3.0 (35 fonts)* . . . . . 255.

Ribbons

3255 Image II Black . 4. 9362 *(12 Pak)* . 29.
3261 Image II Multi-4-Color 9. 9810 *(6 Pak)* 39.

★Sopris Softworks ... 60 day MBG

Ripstop Nylon Dust Covers . . . . . call.
4014 High Trek Mac SE & Ext. Kybd. Case 69.

★Targus ... 60 day MBG

3617 Mac Plus/SE Case *(fits classic)* . . . . 59.
4015 Mac SE & Ext. Kybd. Carry Case . . 75.

★Tripp Lite ... 30 day MBG

6199 Isobar 4 *(surge suppressor, 4 outlets)* 49.
6200 Isobar 6 *(surge suppressor, 6 outlets)* 59.

STORAGE MEDIA

★Sony ... 60 day MBG

3297 3½" DS/DD Disks *(10)* . . . . . 12.
6148 3½" DS/DD Disks 3 Pak *(30)* . . . . . 29.
3298 3½" HD Disks 1.44 Meg *(10)* . . . . . 19.
6375 3½" HD Disks 3 Pak *(30)* . . . . . 49.
8185 QD2040 Tape Cartridge . . . . . 19.

★MacConnection ... 60 day MBG

6592 44 Meg Removable Cartridge . . . . . 74.
9728 44 Meg Removable Cart. *(10 Pak)*. 699.



Global Village ... 30 day MBG

TelePort A300–1990 MacUser Editors' Choice Award for *Best Communications Product*. 2400 bps/MNP-5 modem connects via ADB Port. SendFax (9600 baud) optional.

8946 *Basic* . . **$139.** 8945 *with FAX* . . **$169.**

★MAXELL ... 60 day MBG

2792 3½" DS/DD Disks *(10)* . . . . . 13.
2793 3½" HD Disks 1.44 Meg *(10)* . . . . . 21.

★3M ... 60 day MBG

3943 DC2000 40 Mb Data Cartridge . . . . 19.

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order (in the U.S.).
- No sales tax, except Ohio residents (please add applicable tax).
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped First Class Mail.
- International orders U.S. $250 minimum.
- Upon receipt and approval, personal and company checks clear the same day for immediate shipment of your order.
- Corporate P.O.s accepted subject to credit approval.
- COD max. $1000. Cash or certified check.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices and promotions subject to change without notice.
- Our order lines are now open 24 hours a day Monday through Friday, and Saturday 9:00 AM to 5:30 PM EST. You can call our business offices at 603/446-7711 Monday through Friday 9:00 AM to 5:30 PM EST.

SHIPPING

Continental US: Barring events beyond our control, all credit card orders phoned in weekdays by 3:15 AM EST will ship Airborne Express for delivery the next business day. Which means *same day* delivery for orders placed between midnight and 3:15 AM EST. (Some orders may ship by UPS Ground for next day delivery). Saturday delivery available to many areas upon request. Some areas require an additional day delivery. The total freight charge on any order placed with MacConnection is only $3.

Hawaii, Alaska, Canada, Puerto Rico and U.S. Virgin Islands: Call 800/334-4444 for information on shipping and charges.

All other areas: Call 603/446-7711 or FAX 603/446-7791 for information.



Standard 12" display: 48.6 sq in screen area

Standard 13" display: 62.7 sq in screen area

New Low-Cost Macs

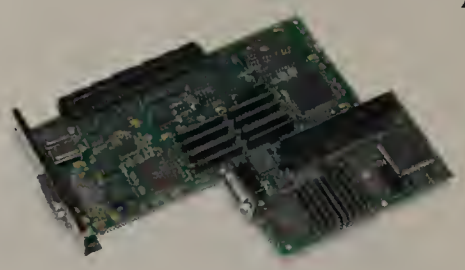


SuperMac 19" display: 151.5 sq in screen area

SuperMac 21" display: 168 sq in screen area.

SuperMatch Display Calibrator assures correct color fidelity every time.

New Low-Cost SuperMacs



No wonder the Macintosh® LC and IIsi are getting the attention of so many design and color publishing professionals. They're tremendous values for the money.

But what happens when you run today's leading color graphics programs on standard 12" and 13" displays? You can only work on a *fraction* of the image you would see on a large-screen display.

That's where SuperMac comes in. We have cost-effective solutions that turn low-cost Macs ... into large-screen SuperMacs. You can see the results on our 19" and 21" displays shown above.

SuperMac's™ low-cost 256-color Spectrum/8™ graphics cards enable the LC and IIsi to run a wide range of displays–more displays, in fact, than *any other* 8-bit graphics cards. So you can mix and match cards and displays to get the best results for your needs.

These new cards have the same features as our cards for high-end Macs. That means your applications deliver one- and two-page spot-color WYSIWYG on the LC and II*Plus* impressive results in presentation graphi and grey scale publishing.

Exceptional price/performance. Our ne Spectrum/8 cards cost less than *half* of co parable graphics cards. So you can purcha one with a 19" SuperMac display–and crea an *entire* high-resolution system for your LC or IIsi–for less th some vendors charge for their displays alone!

Visit your SuperMac reseller now, and see how affordable larg screen color can be. To find the nearest reseller, call toll-fr today: 1-800-624-8999 (ext. 210).

SUPERMAC

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Circle 88 on reader service card

ART BEAT

by Cathy Abes

The tools and the talent behind Macworld's graphics and the techniques that make them possible

Artist: Mark Jasin is a Los Angeles–based commercial and fine-art Macintosh illustrator who specializes in print media. He is currently working on a poster for the World Football League, introducing American football to Europe, and a movie poster for Columbia Pictures.

Hardware: Mac IIci with 8MB of RAM and an 80MB internal hard drive; SyQuest 45MB removable-cartridge drive; 300MB external hard drive.

Software: StrataVision 3d 1.4.2, Adobe Photoshop, Aldus FreeHand 3.0.

How It Was Done: To create the opening illustration for "Getting Started with Resource Editing," Jasin combined bitmapped and PostScript images by importing 8-bit color PICT files into StrataVision 3d and high-resolution color TIFF files into Adobe Photoshop and Aldus FreeHand. "I was able to create the two flying figures in FreeHand—with the illusion of 3-D—much more quickly than I could have modeled and rendered them in a 3-D program."

First Jasin went into the Control Panel and created three separate desktops, each with a different background color pattern. Then he created a screen dump of each desktop and opened each one in StrataVision 3d. In StrataVision, he drew a sphere by selecting the Sphere tool from the tool palette. To set the surface-mapping attributes for the sphere, he chose Object Parameters (⌘-B) under the Options menu. Surface-mapping parameters work in conjunction with one another to determine how the image map is applied to an object's surface—the map's size, location, and number of repetitions.



The final FreeHand illustration is a combination of color TIFF and color PostScript images.

Jasin used the default settings for mapping type (in this case, spherical), tiling style (normal), and horizontal and vertical repetitions (infinite, so that the entire surface of the sphere would be covered). Then, to determine the size and location of the mapped image and the number of times it would be repeated on the sphere's surface, he set the mapping coverage (the horizontal coverage to 25 percent and the vertical to 50 percent).

After selecting the New Attribute button, in the resulting Attribute Editing dialog box he made the sphere white, opaque (0 percent clear), and shiny (80 percent gloss). Then he imported the desktop screens as separate color maps and mapped them onto the spheres and the flat surface he had created.

Next, in StrataVision's Isometric view, Jasin composed a scene containing all the 3-D objects. To determine what color the shadows would cast, he chose Lighting Options (⌘-J) under Rendering and selected neutral 50 percent gray ambient lighting. Then he selected four different light sources from the tool palette: three global lights and one spotlight—each one assigned a different color and intensity.

Next, under the Rendering menu, Jasin chose Rendering Options. In the resulting dialog box, he enabled the rendering effects he had previously set for all the objects so that those effects would be activated when the scene was rendered.

All the objects created in StrataVision 3d already had shadows, but the two flying figures—products of a 2-D program, FreeHand—did not. So Jasin imported the 3-D scene into Photoshop, where he could simulate the missing shadows. Using the lasso tool, he outlined the areas where he thought the shadows of the flying figures should fall. He used two features—

(continues)

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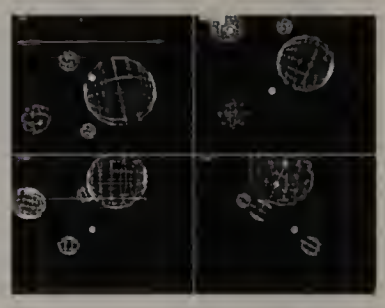
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One of the original desktop images the artist created for mapping onto the 3-D objects.



The Four Views window in StrataVision's wire-frame mode after Jasin had created the objects and set their attributes.



One of the color PICT desktop images mapped onto a sphere and preview-rendered in Phong mode.

both in the Adjust submenu under the Image menu—to complete the shadows.

To darken the shadow areas, he first selected Brightness/Contrast and reduced their brightness. Then using Color Balance, he manipulated their hue and saturation so they'd match the shadows of the 3-D rendered objects. Finally, after doing some minor touch-ups including softening the edges of the shadows, he decided to remove one of the 3-D spheres. Using Photoshop's rubber stamp tool, he cloned a part of the blue desktop pattern and placed it over the sphere, effectively erasing it.

After importing the final TIFF file into FreeHand,



The final 3-D rendered image saved in StrataVision 3d as a TIFF file.



The flying figures created in FreeHand scaled and positioned relative to the imported 3-D rendered background.



The 3-D rendered background imported into Photoshop after Jasin created shadows for the two figures and erased one of the spheres.

Jasin combined the background and shadows with the PostScript image of the figures already in FreeHand. (The gradations on the figures were created to match the 3-D light source of the rendered objects.) ◘



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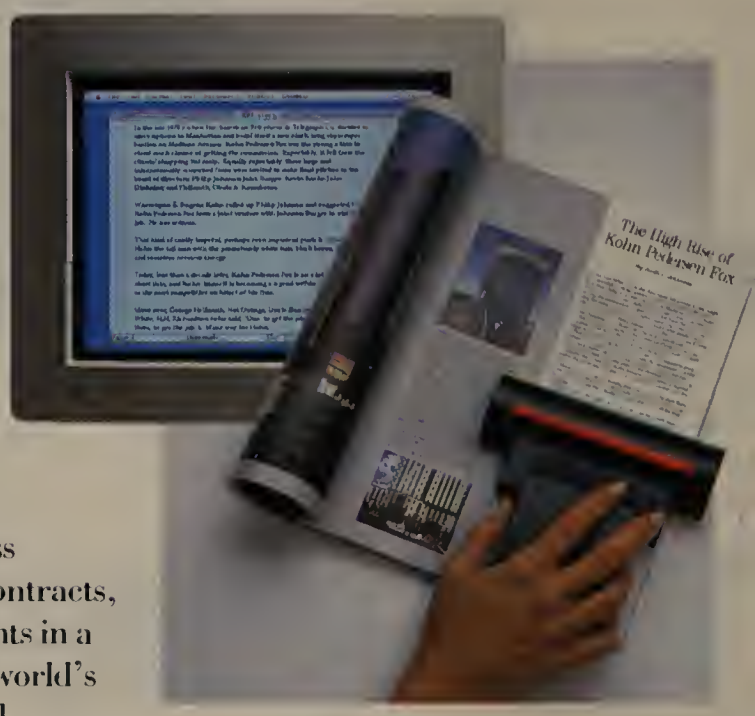
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How the Good Guys Finally Won

LOTUS MARKETPLACE IS DEAD. HERE'S HOW IT WAS KILLED.

BY STEVEN LEVY

Larry Seiler does not consider himself a troublemaker. Not even a gadfly. But one day when he called up his electronic mail he read a message that stunned him. The Lotus Development Corporation was preparing to ship a product called Lotus Marketplace: Households. The most important component of this software–CD ROM package was a listing of names and personal data, including estimated income, of more than 120 million Americans. Including, almost certainly, Larry Seiler.



SCOTT BALDWIN

The 35-year-old computer consultant–engineer was incensed at what he considered an intolerable invasion of his privacy. He called Lotus to verify the information and found that, yes, Marketplace: Households was indeed headed toward the pipeline. So he wrote a letter to Lotus Development Corporation, taking advantage of Lotus's offer to remove his name from Marketplace. He gave Lotus CEO Jim Manzi a few things to think about while he was at it. Here is a flavor of his prose:

"If you market this product, it is my sincere hope that you are sued by every person for whom your data is false, with the eventual result that your company goes bankrupt. . . . I suggest that you abandon this project while there is time to do so."

Lotus thought so much of Seiler's suggestion that the company did just that. On January 23, 1991, Lotus and its partner in the enterprise, a billion-dollar personal-data company called Equifax, aborted Marketplace after Lotus had put an estimated $10 million into the project. It seems that Seiler's opt-out request was one of approximately 30,000 that Lotus had received in the brief period since the product announcement in August of 1990. In addition, consumer groups and privacy advocates were declaring war on Marketplace. It was, said Manzi, "an emotional fire storm," one that would be difficult—and expensive—to extinguish. So, to the astonishment of Larry Seiler, who never expected such an easy win, Lotus and Equifax killed the product.

According to the statements of Manzi and his counterpart at Atlanta-based Equifax, former IBM executive C. B. (Jack) Rogers, Jr., the whole muck-up was largely the result of a flawed perception of the product—

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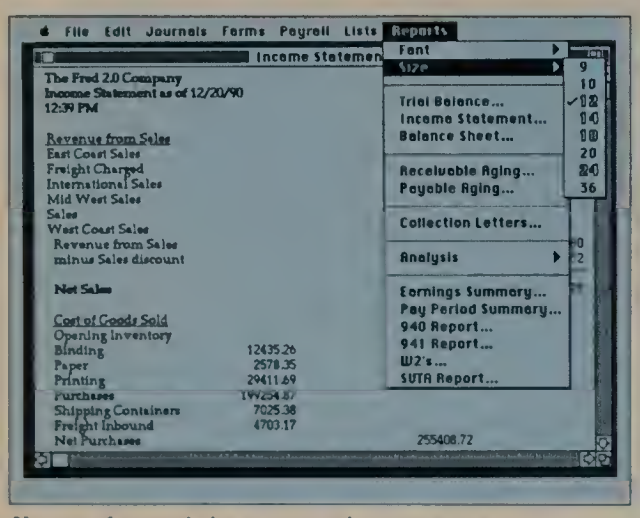
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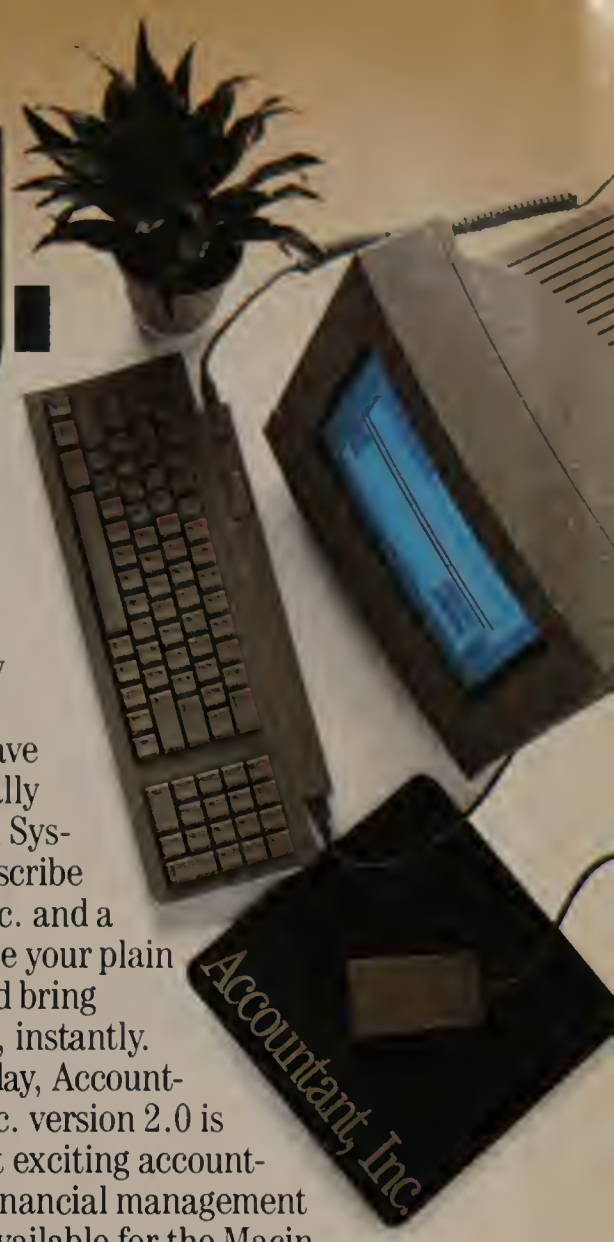


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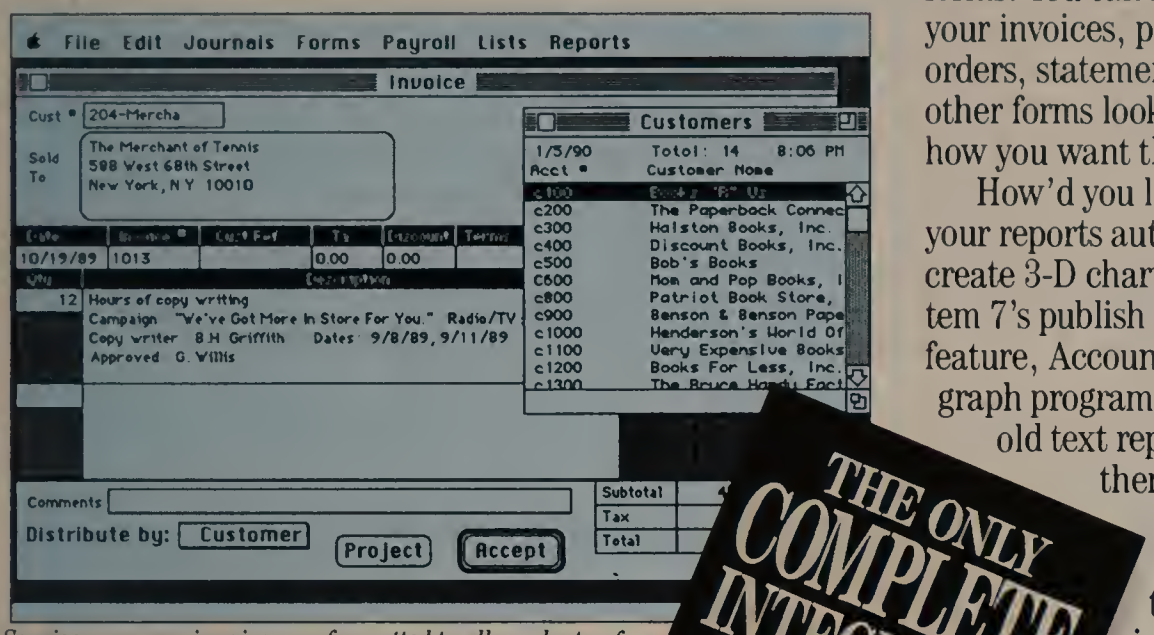


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folks just didn't understand how harmless it really was, nor how it would help them.

But the truth is that the misperception was on the part of Lotus Development Corporation. Marketplace was doomed from the beginning, one of a series of bizarre missteps by Lotus in the Macintosh market. Instead of delivering the product that people have been expecting from Lotus since the introduction of the Mac—a killer spreadsheet—the company ventured into the treacherous territory of privacy issues in the electronics age.

To Market, to Market

It began in early 1989. Dan Schimmel, chief developer of Marketplace, considered it a natural extension of Lotus's ventures into CD ROM technology. A wonderful aid to small businesses—desktop direct mailing. Previously, the process had been, by and large, limited to big institutions. Lotus Marketplace would change that.

The Lotus product was essentially a HyperCard front end to a package of shiny discs holding names, addresses, marital status, age groupings, and estimated buying habits of almost every American with plastic in his or her pocket—and their families. Users could tool around with the data until a list was produced that met the characteristics they were looking for—elderly, apartment-dwelling cat owners in Toledo, or rich foreign-car buyers with children in a suburb of Seattle. It was to be a classic case of the personal computer delivering the leverage of the big shop to the desktop. Lotus would use its software-design skills and marketing expertise to move the product; Equifax would provide the information from its vast stores of data held on millions of Americans.

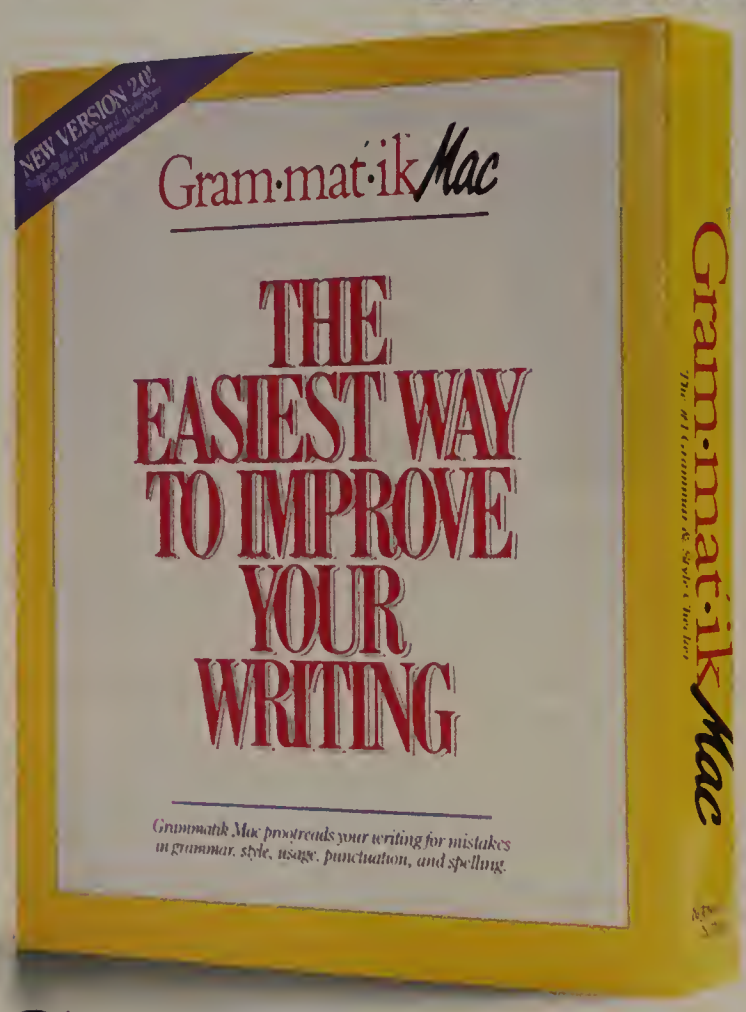
But there was a fly in this ointment: the nature of direct-mail marketing and personal-information databanks. Basically, they rely on the unwitting compliance of the people whose names and demographic profiles—often including revealing credit information—are being sold. Consumer advocacy groups have griped about the process for years, but those who profited from the industry insisted that when people understood the process, they had no complaints.

"We felt from the get-go that privacy was an issue we would address," says Schimmel. Lotus decided not to offer two kinds of data that would set off alarm bells in consumer advocacy circles: phone numbers and credit ratings. But other safeguards were required. To figure out what these would be, Lotus and Equifax took surveys, ran focus groups, and used as a consultant Dr. Alan Westin, a Columbia professor who is recognized as the grand guru of privacy issues.

The scheme that emerged made Marketplace into an obstacle course for its users, all in the service of protecting the public. When you paid $695 for Marketplace: Households, you would essentially be buying a

(continues)

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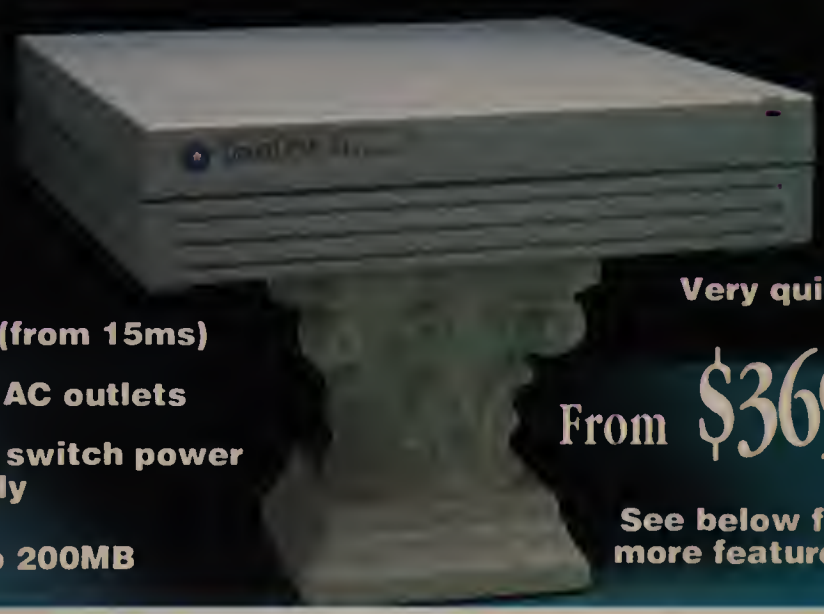
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useless box. To get the good stuff—the disc with the names—you were supposed to send Lotus proof that you were a legitimate business. Along with the discs, you would receive stern admonitions about their use. The information itself was limited—though it did list names, addresses, marital status, sex, race, and dwelling type, really personal stuff like income and life-style data were not tracked to individuals, but to nine-digit zip code areas. And even if you wanted to, you couldn't search the disc by name.

Finally, a metering system was to charge you each time you printed out a list of names. Some of the names were dummies, and if you sent an objectionable mailing to those addresses—stuff like pornography—Lotus planned to cut you off at the knees.

Marketplace Confidential

Was this enough for the privacy advocates? No. Most privacy-oriented groups are working to impose more restrictions on the direct-mail industry—how could they embrace something that would extend circulation of personal information from a relatively small number of companies to millions of potential junk-mail producers?

So naturally, the groups, spearheaded by the Computer Professionals for Social Responsibility (CPSR), objected. They complained about some data coming from credit records, a gray area of the law. And they raised a fuss about insufficient notice for those who wanted to opt out. But Lotus had expected complaints from the privacy people—they even figured, says one source, that the controversy would be good publicity for the product! What Lotus didn't figure on was the very ground of privacy opinion shifting from underneath it.

"In the past two and a half years [since Marketplace was first conceived], public attitudes about the use of information underwent a significant change," says privacy expert Alan Westin. "Previously, people thought that the only ones who cared were the 'privacy nudnicks.' But in 1990 I came out with a major survey—done by the Louis Harris polling firm—which revealed that it was not only the highly educated people who were concerned, but everyone across the board." Indeed, 71 percent of the respondents thought that consumers have lost all control over the use of their personal information by corporations. It was logical to think that Marketplace would be regarded as one more threat to an already beleaguered right to personal privacy.

This news came too late for Lotus and Equifax. The problem was that with privacy concerns high, Marketplace was a natural jumping-off point for the media to discuss the question of whether personal information should be sold in the first place.

By being framed in the middle of this controversy, Marketplace suffered. "No matter how many privacy

(continues)

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protections are built in, if the concept itself sounds formidable, you never get to explain," says John Baker, senior vice president of Equifax. As it turned out, negative publicity began rolling in, from places like the *Wall Street Journal*. Marketplace's image was tarnished and the stain threatened to spread to the reputations of the companies involved.

Tales from the Encrypt

Compounding this problem for Lotus and Equifax was another potential rat's nest. The privacy protections in Marketplace were contingent on preventing the user from free access to the names and information on the disc, so you couldn't do things like search for specific names, or copy the information into a database and pass it on to the local porno distributor. But it is not at all clear that Lotus had adequately protected the data.

Dan Schimmel of Lotus denies that this ever became an issue, but according to Alan Westin, "questions were raised by Equifax and me whether we would be able to look at the public and say that Marketplace has adequate security. If you don't have it, you won't be able to keep your promises—then it's not a security problem, it's a confidentiality problem." Already, some critics were vowing not only to crack the program and announce their results, but to distribute the procedure on cracker bulletin boards so anyone could do it.

Apparently Lotus felt that its confidential data-compression scheme would be adequate to keep all but the most skilled security experts from cracking the program. But Equifax wasn't blindly accepting Lotus's assurances. According to John Baker, if the product had gotten close to shipping, Equifax was ready to use a "tiger team" of computer wizards to crack a beta copy. If the Equifax team did the trick, Marketplace would have required sophisticated encryption—which would have increased costs and incurred delays in implementation.

The Net Result

The final straw for the product, though, was probably the direct onslaught of negative response characterized by Larry Seiler's letter. It was a real problem for Lotus to accommodate thousands of people suddenly opting out, especially since the product was on CD ROM and could not be easily recalled once it was sent out. But even more demoralizing for Lotus was the viciousness of the responses, many of which were sent directly to Jim Manzi's electronic mailbox.

Amazingly, this deluge came not as the result of an organized campaign, but from a grass-roots movement spurred by the ease of communication on computer networks. Concerned citizens would collect packets of information on the product and, with the ease of computer mail, send the data packages to dozens of friends. Who would send it to their friends.

This chain-letter-style communi-

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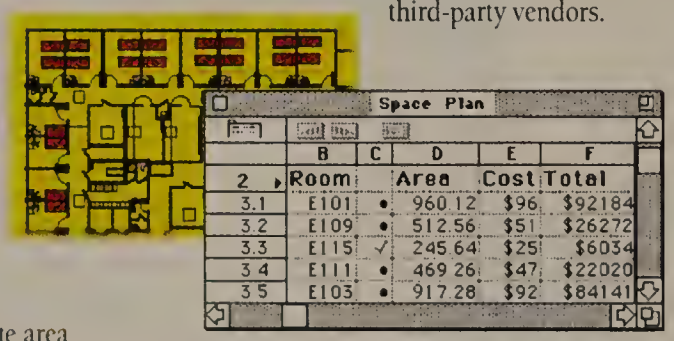
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Font Monger ..... 62.

Dream Maker
MacGallery (HyperCard) ..... 26.
MacGallery (MacPaint) ..... 26.
Cliptures: Business Vol 1 .... 68.
Cliptures: Business Vol 2 .... 68.
Cliptures: Sports Vol 3 ..... 68.

T/Maker
Click Art
Business Cartoons ..... 31.
Business Images ..... 31.
Christian Images ..... 38.
Personal Graphics ..... 31.
EPS Animals And Nature ..... 82.
EPS Business Art ..... 82.
EPS Illustrations ..... 82.

Graphics and Design

Adobe Systems Inc
Type Align ..... 58.
Illustrator 3.0 w/ ATM ..... 348.
Type Manager 2.0 ..... 54.
Photo Shop ..... 498.
Streamline 2.0 ..... 118.

Aldus
Freehand 3.0 ..... 398.
PageMaker 4.0 ..... 498.
Digital Darkroom 2.0 ..... 258.
Personal Press 1.0 ..... 198.
Super 3D 2.1 ..... 338.
SuperPaint 2.0 ..... 134.

Altsys
Art Importer 2.0 ..... 84.
Fontographer 3.2 ..... 258.

Brøderbund
Kid Pix ..... 31.
BannerMania ..... 36.
Print Shop ..... 34.
TypeStyler 1.5 ..... 114.

CE Software
Amazing Paint ..... 64.
Calendar Maker 3.0 ..... 30.

Claris
MacPaint II 2.0 ..... 89.
SmartForm Designer ..... 288.

Deneba
Canvas 2.1 ..... 188.
UltraPaint ..... 124.

Dynaware USA, Inc
DynaPerspective 2.0 ..... 599.

Electronic Arts
Studio 8 2.0 ..... 188.
Studio 32 ..... 448.
Studio 1 ..... 55.

Frame Technotogy Corp
Frame Maker ..... 795.

Letraset Graphic Design
ColorStudio ..... 598.
ImageStudio ..... 138.
ReadySetGo! 4.5 164

Mainstay
Capture 4.0 ..... 74.
ClickPaste ..... 59.

NEC
Intersect CDR-36 Type Gallery PS Bundle ..... Call
Type Gallery PS, Photo Gallery, Image Gallery, or Clip Art 3-D ..... ea.245.

Olduvai
Video Paint ..... 278.

Paracomp
Draw Tools ..... 58.
Model Shop ..... 374.
Swivel 3D Professional ..... 434.
Swivel Art 3D ..... 81.

Pixar
MacRenderman ..... 630.
Showplace ..... 468.

Preferred Publishers
Exposure Pro ..... 68.
Master Color ..... 99.
MasterPaint 1.0 ..... 49.

Quark Inc.
Quark Xpress 3.0 ..... 518.
QuarkStyle ..... 188.

Satient
Partner 1.01 ..... 55.

Softview
if:X Forms Designer 1.0 ..... 168.

SuperMac Technology
PixelPaint 2.1 ..... 148.
PixelPaint Pro 2.0 ..... 458.

Timeworks
Publish It Easy 2.0 144

Ventura Software
Ventura Publisher for Mac . 498.

Zedcor, Inc.
DeskPaint/ Draw 3.0.3 ..... 112.

Graphsoft MiniCad+ 3.1

MiniCad+ is a product that integrates a spreadsheet and a relational database into a drawing so you can keep track of costs as the design evolves. Database information linked to a particular object stays with that object even when it is cut and pasted into another drawing. MiniCad+ also has a built-in programming language and a "smart cursor" to aid in the finer points of drafting.

MiniCad+ 3.1 .....$585



First with new products



Applied Engineering Cache-In

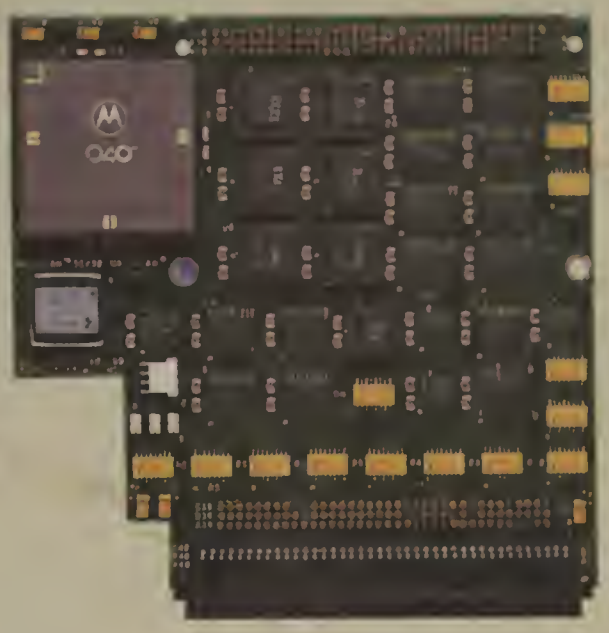
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Cache-In $194

Total Systems Magellan 040 Accelerator System

The Magellan series of Advanced High Performance Accelerators for the Apple Macintosh family of computers is designed to augment the Macintosh host platform CPU with the high performance 32-bit integrated CPU/FPU/PMMU engine of the Motorola MC68040. The supported Apple platforms include the Macintosh SE/30 Macintosh IIsi, Macintosh IIci, and Macintosh IIfx.

040 Accelerator $1925





Business Plan Toolkit

A practical toolkit for preparing a professional business plan with complete financial analysis, charts, sales forecasts and winning text. Includes complete sample plan and workbook. Received 4.5 mice from MacUser. Works with either Excel or Works.

Business Plan Toolkit $95



Cayman Systems GatorBox CS

Cayman Systems AppleTalk-Ethernet gateway, the GatorBox CS connects an entire Macintosh network on LocalTalk to high speed Ethernet. Plug and play AppleTalk routing capabilities are built into the GatorBox CS, so users on LocalTalk can immediately share files, mail and network devices with users on other LocalTalk and Ethernet networks. Other features include: two megabytes of RAM; vented housing for cool and reliable operations; hardware and software diagnostic capabilities and a universal power supply for world wide use. The GatorBox CS fully supports AppleTalk Phase I and II and the TCP/IP protocol suite.

GatorBox CS $1955

ACCELERATORS

Applied Engineering
- Cache-In IIci ..... 194.
- Classic 1Mb Upgrade ..... 118.
- Portable Upgrade w/1Mb SRAM ..... 395.
- Quadralink ..... 208.

Connectix Corporation
- Virtual - SE/30 IIx, IIcx, IIci 114.

DayStar Digital

PowerCache 030 IIci
- 40mhz w/o FPU ..... 948.
- 40mhz w/FPU ..... 1,165.
- 50mhz w/o FPU ..... 1,688.
- 50mhz w/FPU ..... 1,950.
- Fast Cache IIci ..... 278.

Powercard 030 w/o CoProcessor
- 25mhz II, IIx, IIcx ..... 1,095.
- 33mhz II, IIx, IIcx ..... 1,240.
- 40mhz II, IIx, IIcx ..... 1,389.
- 50mhz II, IIx, IIcx ..... 1,895.

Dove Computer Corp

MacSnap Upgrades

Marathon030 Upgrades -
- Bundled with Virtual ..... 528.

Orange Micro
- Mac 286 V3.0 ..... 1,078.
- Mac 86 Card SE ..... 265.
- Orange Micro 386 16Mhz. 1,695.
- Orange Micro 386 20Mhz. 1,875.

Total Systems

Magellan
- Mac IIsi, IIfv, SE/30, IIci .. 1925.

Mercury
- 030 16mhz (Plus) ..... 518.
- 030 16mhz (SE) ..... 388.
- 32-bit SCSI Module (Plus) . 188.
- RAM Module ..... 245.

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- 030 20Mhz ..... 795.
- 030 25Mhz ..... 995.

Gemini II
- 030 33mhz ..... 1,370.
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- 030 50mhz ..... 1,595.
- Gemkit (Intl. or U.S.) ..... 128.
- MercuryKit..... 95.

ACCOUNTING & FINANCE

Aatrix
- Ultimate Payroll 4.05 ..... 188.
- Multi-Company ..... 309.
- Checkwriter II 3.2 ..... 31.
- Payroll 4.0 ..... 108.

Checkmark Software
- MultiLedger 1.3 ..... 234.
- Payroll 4.5(MultiLedger) .. 174.
- Cash Ledger ..... 114.

Computer Assoc. - Bedford
- ACCPAC Bedford 1.2 ..... 138.

in House Software
- In House Accountant ..... 135.

Intuit
- Quicken 1.5 37

Peachtree/Layered
- At Once ..... 284.

Meca Ventures
- Managing Your Money ..... 134.

Nolo Press
- For The Record 2.0 ..... 30.
- Will Maker 4.0 ..... 35.

Reality Technologies
- WealthBuilder ..... 144.

Softsync/Bloc
- Accountant Inc. Pro ..... 338.

Softview
- if:X Expense Reports ..... ea.49.

Survivor Software
- Invoice It ..... 48.
- MacMoney 3.5 ..... 58.

TELEWARE incorporated
- M.Y.O.B. 2.0 ..... 141.

The Software Toolworks
- Dollars And Cents 5.0 ..... 62.

TimeSlips
- TimeSlips III 2.0 ..... 194.

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Dynodex or Dynopage $72



Beacon Technology HyperBible 2.0 or Gems of the Word

Experience an entirely new world of Bible study on your Mac! HyperBible is a HyperCard version of the famous Thompson Chain Reference Bible, complete with thousands of encyclopedia-type references. Gems of the Word is a bible program that everyone can enjoy! It gives you an easy to access database of over 2000 of the best loved, most often quoted passages. Gems offers a start-up program to give you a "Verse of the Day" personalized to your interests.

HyperBible 2.0 .....$124
Gems of the Word $25

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Excel 3.0 now shipping

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MacCon SE/30 E or ET ..... 340.
MacCon + II E or ET ..... 340.
MacCon + 30i E or ET ..... 340.

Caravelle Networks Corp
Mac To Mac 5 Pack ..... 164.

Cayman Systems
Gator Box CS ..... 1,955.
Gator Share Software ..... 1,350.
Gator Card E/II (II Series) ..... 458.
Gator Mail O (10 Users) ..... 675.

CE Software
QuickMail 2.2.3 (1-5 User) 209.

DataViz
MacLink Plus PC 5.0 ..... 128.
MacLink Translators ..... 97.

Dayna Communications Inc
EtherPrint -T ..... 348.
EtherPrint Plus ..... 625.
DOS Mounter 2.0 ..... 53.

DayStar Digital
LT 2 MC LocalTalk Board ... 295.
LT 2 PC LocalTalk Board .... 185.

Fairfield
Clear Access 1.3 ..... 406.

Farallon
Ethernet
Mac II Card ..... 358.
SE/30 Card ..... 358.
Portable Pak ..... 328.
Star Controller EN500 1,588
PhoneNET Star Cont. EN ... 120.
PhoneNET
DIN-8 ..... 32.
DIN-8 (10 Pack) ..... 197.
DB-9 ..... 34.
Liaison 3.0 ..... 258.
Star Connector ..... 17.
Star Controller 300 ..... 824.
Star Connector (10 Pack) ..... 125.
PhoneNet To AppleTalk ..... 8.
Remote Wakeup
Modem Cable ..... 31.
Timbuktu 4.0 (30 User) . 1,284.
Timbuktu 4.0 ..... 94.
Timbuktu Remote ..... 122.
Access Pack ..... 844.

Insignia Solutions
Access PC ..... 61.
Soft PC 1.3 ..... 244.
Soft PC EGA/AT ..... 124.
Soft PC Classic ..... 125.

Int'l Business Software
DataClub 3 Pack ..... 189.
DataClub 10 Pack ..... 525.

Microcom
Carbon Copy Mac ..... 116.
Carbon Copy Twin Pack ..... 168.

Nuvotech
Nuvolink II ..... 271.
Nuvolink SC ..... 350.
Turbo Bridge ..... 318.
Turbo Net
DB-9 ..... 19.
DIN-8 ..... 19.
DIN-8 (12pk) ..... 198.
St - DB-9 ..... 29.
St - DIN-8 ..... 29.
St 12 Pack DIN-8 ..... 278.
Turbo Star ..... 825.

Shiva
Netbridge ..... 405.
Netserial ..... 274.
Fast Path IV ..... 1885.

Sitka/TOPS
Ethergate ..... 1615.
Telebridge ..... 408.
Tops 3.0 Network Mac ..... 186.

Systems Compatibility
Software Bridge Mac ..... 78.



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GraceLAN $217

Programming

Digitalk
SmallTalk/Vmac ..... 123.

Mainstay
V.I.P. ..... 85.

Microsoft Corporation
Quick Basic 1.0 ..... 63.

Paragon Concepts
Qued-M ..... 85.

Serius Corporation
Serius Developer ..... 339.
Serius Programmer ..... 210.

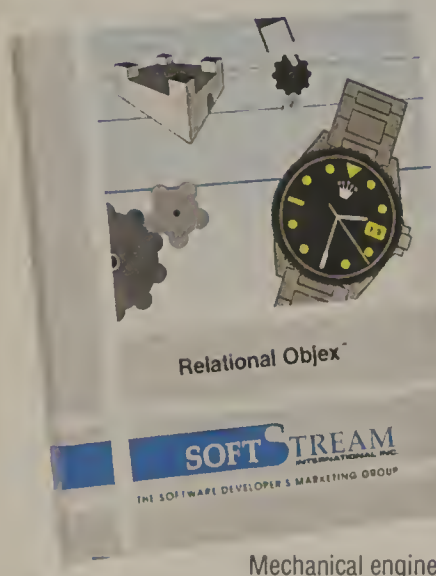
Serius Corporation
Animation Objects ..... 64.
Communication Objects ..... 64.

Symantec
Think C 4.0 ..... 164.
Think Pascal 3.0 ..... 164.
Just Enough Pascal ..... 51.

TGS Systems
Prograph 2.0 W/Compiler .. 244.

True Basic
True Basic 2.02 ..... 54.

Zedcor, Inc.
ZBasic 5.0 ..... 98.



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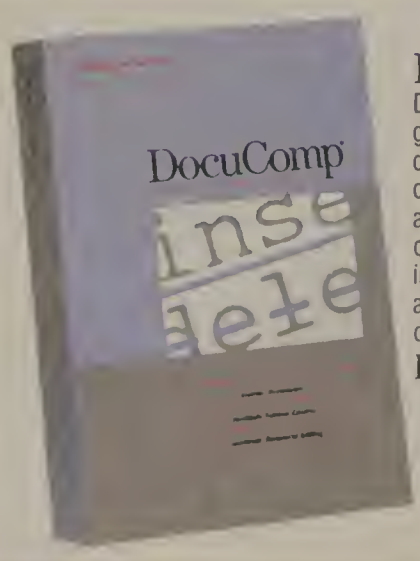
Relational Objex™ $145



Data Viz MacLink Plus/PC 5.0

MacLink Plus/PC 5.0 is a complete kit for transferring and translating documents between a Macintosh computer and an IBM PC. It comes with everything needed; an RS232 cable, software for both machines, the full library of translators, and DOS Mounter software. The library of over 350 conversion solutions translates file formats from word processors, spreadsheets, databases, and graphics, while the included DOS Mounter software provides visibility to DOS disks inserted in the FDHD drive both on the Macintosh desktop and within all Mac applications.

MacLink Plus/PC $135



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DocuComp automatically generates marked-up documents in seconds! It can compare any two versions of a document and report changes as minor as an inserted comma and as major as a complete rearrangement of text.

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Abaton Technology Corp
InterFax 12/48 ..... 264.
InterFax 24/96 ..... 348.

Applied Engineering
DataLink Mac Internal
2400 Baud ..... 208.
w/ MNP 5 ..... 235.
w/ MNP 5 and SendFax ..... 269.
DataLink Express External
2400 Baud ..... 174.
w/ MNP 5 ..... 195.
w/ MNP 5 and SendFax ..... 235.
DataLink LC Internal
2400 w/ SendFax ..... 245.
2400 v.42 bis w/ Sendfax .. 265.

CompuServe
Navigator 3.0 ..... 48.
Starter Kit ..... 22.

Dove Computer Corp
Dove Fax 24/96 ..... 294.
DoveFax Plus ..... 395.

Everex Systems
EMAC 2400 w/MNP 5 ..... 175.

FreeSoft Co.
White Knight 11 ..... 84.

Global Village Communications
TelePort ADB 2400 MNP 5 . 128.
TelePort ADB SendFAX ..... 184.

Hayes
Smartcom II 3.1 ..... 83.

Microcom
Mac Modem V.32 MNP 9 .. 688.

Orchid Technology
Orchid Fax Modem 96/96 .. 428.

Preferred Publishers
Double Talk ..... 78.
Double Talk Twin Pack ..... 128.

Prometheus
External Modems
2400 Mini ..... 128.
2400 w/ MNP 5 ..... 218.
Internal Modem
2400 w/ MNP 5 ..... 245.
Tavel Modem ..... 188.

ProModem DateFax Series
9600M Plus ..... 698.
24/96 MiniFax ..... 188.
24/96 Send/Receive Fax .... 288.

Shiva
Netmodem V2400 ..... 338.
Netmodem V.32 9600 .... 1,165.

Software Ventures
Microphone II 3.0 ..... 214.

Solutions
BackFax ..... 152.
Faxgate Plus 1 1 ..... 238.

Supra Corporation
Supra 2400 ..... 118.
Supra Plus 2400 179
Supra 2400 MacPac ..... 178.

Synergy Software
Versa Term 4 1 ..... 87.
Versa Term Pro 3 0 173

U.S. Robotics
Courier Hst Dual Std V 42 .. 995.
Courier Hst Std V 42 675

Prepare for System 7.0

Word Processing

A Lasting Impression
Resume Expert ..... 47.
Cover Letters ..... 47.
Ashton Tate
Full Write Pro 1.5 ..... 145.
Baseline Publishing
Thunder 7 ..... 56.
Caere Corporation
Omnipage 2.1 ..... 494.
The Typist ..... 478.
Claris
MacWrite II 1.1 ..... 138.
Delta Point
Taste ..... 83.
Franklin
Language Master ..... 44.
Lifetree Software Inc.
Correct Grammar 2.0 ..... 55.
Microsoft Corporation
Word 4.0 ..... 244.
Paragon Concepts
Nisus 3.01 ..... 244.
Personal Bibliographic
ProCite ..... 195.
Petroglyph Inc.
Editorial Advisor ..... 92.
Preferred Publishers
Vantage 1.5 ..... 50.
Reference Software
Grammatik Mac 2.0 ..... 47.
SNA
Stylist ..... 45.
Tactic Software
Magic Typist ..... 100.
T/Maker
WriteNow 2.2 ..... 116.
Smart Bundle ..... 214.
WordPerfect Corporation
WordPerfect 2.0 ..... 278.



Farallon Timbuktu 4.0

This new version of the Eddy Award winning software now supports color and provides clipboard exchange and full background file transfer. Timbuktu is a versatile network application that allows you to observe or control another Macintosh over any AppleTalk network. With Timbuktu, multiple users can share multiple screens across the network, thereby turning any software application into a team activity.

Timbuktu 4.0 ..... $95

Accessories

American Power Conversion
UPS 110SE ..... 208.
UPS 370ci ..... 338.
Basic Needs, Inc.
Utility Pac ..... 15.
Hardtop Keyboard Covers
Mac Plus KB ..... 15.
Mac LC KB ..... 15.
Mac Standard KB ..... 15.
Dust Covers
Mac Classic w/LC KB ..... 16.
Mac LC w/12" Monitor LC KB 17.
Mac IIsi w/13" Mon Ext. KB .. 17.
Mac IIcx/ci w/13" Mon Ext. KB17.
Mac II/x/fx w/13" Mon Ext. KB17.
SE w/Standard KB ..... 16.
SE w/Extended KB ..... 16.
Basic Needs, Inc.
MacPlus w/Plus KB ..... 16.
ImageWriter II ..... 11.
ImageWriter LQ ..... 15.
LaserWriter II SC/NT/NTX ... 17.
HP Deskjet/Deskwriter ..... 11.
HP Laserprinter Series II/III . 15.
Color Dex
Labeling Kit ..... 35.
CoStar
Label Writer ..... 178.
Organizer ..... 198.
Organizer Jr ..... 78.
Ergotron
Mac Tilt Classic ..... 67.
Mac Tilt Platinum Plus ..... 67.
Mac Tilt SE ..... 67.
Farallon
Voice Digitizer ..... 88.
Sound System 2.02 ..... 158.
Go Technology
Hot Keys ..... 39.
I/O Design
Black or Blue
Imagewriter II Bag ..... 48.
Mac Luggage Classic/SE ..... 64.
Mac Luggage II/IIfx ..... 98.
Mac Luggage IIcx/ci/s ..... 84.
Mac Luggage SE Ext. ..... 74.
Ultimate Classic Std ..... 68.
Ultimate SE ..... 78.
Ultimate SE Neon Colors ..... 88.
Kensington
Antiglare Filter 13" Apple ..... 62.
Kensington
Mac II Mon. Cable Ext. Kit .... 32.
Mac II Monitor Stand ..... 64.
Mac IIcx Monitor Stand ..... 54.
Masterpiece Mac II ..... 105.
Pass Proof ..... 69.
Polarizing Filter ..... 32.
SE Anti Glare/Rad. Filter ..... 51.
Super Base ..... 31.
System Saver Mac ..... 62.
System Saver SE ..... 52.
Tilt Swivel For SE or SE/30 .. 21.
Apple Security Kit System ... 32.
Power Backer 360 ..... 269.
Power Tree 10 ..... 19.
Power Tree 20 ..... 27.
Power Tree 50 ..... 54.
Monster Group Inc.
MacSpeaker ..... 169.
PLI
PLI Case Infinity Turbo 40 ... 60.
Smack A Mac
Covers
13" Mon. & Ext Keyboard ..... 18.
SE/Plus Ext. Keyboard ..... 17.
SE/Plus Std. Keyboard ..... 17.
Smack A Mac Stuffed Mac ..... 8.
Toner Cartridge
II NTX ..... 104.
LaserWriter Plus ..... 89.
Targus Bags
Cx/Ci Black ..... 74.
Mac/SE Reg. Black ..... 54.
Mac/SE Xtb Blk,Gry,Wine .... 68.
Imagewriter Bag Blk or Blu .. 45.



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Springboard Publisher II $108

Microsoft Excel 3.0

Excel 3.0 succeeds in making even your most powerful analytical tool incredibly easy to access. Many of the tools you use most are now on the Toolbar. Instead of executing several steps to sum a row or column of numbers, now you simply click Autosum. You also just click a button to format worksheets. Create charts. Apply styles. Run macros. And do much more. Version 3.0 has new, powerful features to assist you in your analytical work, such as outlining, goal seeking, and other intelligent tools. And development tools let you customize Microsoft Excel to your specific needs.



Excel 3.0 ..... $314

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How to Write a Business Plan $85

Logitech, Inc. ScanMan Gray Scale Scanner

Add photos, drawings, text, etc., into any application with Logitech's ScanMan Model 32 hand held scanner and enhanced version 2.1 software. Easily merge two or more scans into one full-page image. 32 gray scales offer superior image quality and easy editing capability. Save images in MacPaint, TIFF and PICT formats. Advanced halftoning capability provides optimum image output on your monitor or non-postscript printers.

ScanMan Scanner $298



I/O Design Inc., The Ultimate SE Carrying Case



For your Mac Classic, SE, SE/30 or Plus computers, go with the "Ultimate" in protection. This case is designed with internal padded pockets for any size keyboard, mouse, cords and cables and a padded divider for an external hard disk. It also features 2 exterior pockets: a padded, zippered pocket in front for note pads, pens or portable printer and an open, side pocket for other accessories. Combine all this with 1/2 inch super high density foam padding and heavy duty hardware to make this the "Ultimate" in Macintosh carrying cases. Available in Blue and Black.

SE Carrying Case $78



Animas True-Color Hand Scanner

Animas is proud to present its True-Color Hand Scanner as the definitive answer to your desktop publishing scanning problems. The ASC105 is invincible and fully equipped with Color Scan MacCheese™ software. It provides you with the flexibility and compatibility to paint, edit and save in the universal PICT format

True-Color Hand Scanner $575

Microtouch Systems UnMouse



The UnMouse does everything a mouse can - only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface:; to make a selection, merely press down. The UnMouse also serves as an extended keyboard. Tap the large red button and you instantly have a Power Keypad with 16 keys available to execute macros (60 in advanced mode). With its one million touch points the UnMouse also performs admirably as a graphics tablet.

UnMouse $180

Business & Presentation

Abacus Concepts
Mac Spin 3.01 ..... 168.
Statview II 1.03 ..... 278.
Statview SE+ Graphics ..... 198.
SuperANOVA 1.1 SE/Plus .. 308.

ACIUS
4th Dimension 2.1 ..... 488.
FileForce 1.0.1 ..... 248.

AEC Management Systems
FastTrack Schedule 1.5 ..... 138.

After Hours Software
Touch Base ..... 88.

Aldus
Persuasion 2.0 ..... 328.

AISB
How To Write A Business Plan ..... 85.

ASD Software
Planisoft ..... 194.

Ashton Tate
Full Impact 2.0 ..... 145.

Avery Labels
Avery Mac Label Pro ..... 47.

Blyth Software
Omnis 5 1.104 ..... 645.

CE Software
Alarming Events ..... 83.

Claris
FileMaker Pro ..... 214.
MacProject ..... 358.

Delta Point
Deltagraph 1.5 ..... 128.

Fox Software
Foxbase+ Mac 2.01 ..... 289.

Individual Software
Power Macros For Excel 2.2 ..... 33.

Informix
WingZ 1.1a ..... 244.

Inman Software
Business Plan Toolkit ..... 95.

Jam Software
Smart Alarms 3.0 .....

Kiwi Software
KiwiEnvelopes! .....

LISI
Sales & Mktg Manager .....

Mainstay
Mac Flow 3.5 1
Mac Schedule 2.0 1
Mac Schedule Plus 1.0 1

MECC
Exploring MS Works 1

MediaLab
PictureLink 1.0 2

Microsoft Corporation
File 2.0 1
PowerPoint 2.01 2
Excel 2.2 2
Office 5
Works 2.0 1

Newton Technology Inc.
GEOvista 1

Odesta
DataDesk 3.0 4
Double Helix III 3.0R6 3

Portfolio Systems
DynoDEX 2.0 .....
DynoPage 2.0 .....

Power Up
Fast Forms 2.0 1
Address Book Plus .....
Calendar Creator .....

Preferred Publishers
Database 1.5 6
Direct Mail .....

Prescience
Expressionist 2.03 .....
Theorist 1.1 2

Salori
Bulk Mailer 3.2.3 .....
Bulk Mailer Plus 3.2.3 1

Shana Corporation
Informed Designer 1.0.4 ... 15
Informed Manager 9
Informed Auto Form 9

SoftStream International In
Endeavor Planner 8

Softview
if:X Sf-171 Federal Emp App 3

Software Discoveries
Record Holder Plus 8

Strategic Mapping Inc.
Atlas * MapMaker 4.5 36

Symantec
More 3.0 26

Symmetry
Marian 8
Key Plan 23

Synex
MacEnvelope 5.0 5
MacEnvelope Plus 2.0 15

Tree Star
FlexiTrace/FlexiGraph 22
Flexitrace 14
Flexigraphs 12

Verticle Solutions
Contact Ease 24

Westware Inc.
Fast Label or Envelope 42

Williams & Maclas
Sticky Business 5
My Disklabeler III 4

Wolfram Research, Inc.
Mathematica Enhanced 64
Mathematica Standard 44

Zedcor, Inc.
Desk 3.03 22

Music

Ars Nova
Practica Musica 2.2 ..... 68.

Coda
Finale 2.5 ..... 548.
MusicProse 2.0 ..... 298.

Great Wave
Concertware + MIDI V5.0 .... 97.

Mark Of The Unicorn, Inc
Performer 3.5 ..... 375.
Pro.Composer 2.3 ..... 375.

OpCode Systems Inc.
EZ Vision ..... 99.
MIDI Play ..... 42.
MIDI Translator ..... 42.

Passport Designs
TRAX ..... 58.
Audio TRAX ..... 128.
Encore ..... 378.
Sound Exciter ..... 48.
MasterTracks Pro 4.0 ..... 318.
Note Writer II ..... 295.

PG Music
Band-in-a-Box ..... 57.

Taclic Software
Sound Clips 1-4 ..... ea. 48.

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Utilities

Aladdin Systems
- Shortcut ..... 45.
- Stuffit Deluxe 2.0 ..... 62.

Alsoft
- DiskExpress II ..... 56.

ASD Software
- FileGuard ..... 138.
- Macess Card Reader ..... 318.

Baseline Publishing
- APB Express Tape ..... 58.
- 1 Shot Worksheet ..... 56.
- INIT Manager ..... 34.
- Talking Moose ..... 23.

Beagle Bros. Inc.
- Flash ..... 124.

Berkeley Systems Design
- After Dark 2.05 ..... 22.
- Stepping Out 2.02 ..... 48.

Casady And Greene
- QuickDEX ..... 33.
- AME Single User ..... 158.

CE Software
- DiskTop 4.0 ..... 62.
- Quick Keys 2 Version 2.0 ..... 93.

Central Point Software
- Mac Tools Deluxe ..... 78.

Connectix Corporation
- HandOff II ..... 56.

Custom Applications
- Freedom Of Press 3.0 ..... 254.
- Freedom Of Press Light ..... 55.

Dantz
- Retrospect 1.2 ..... 147.
- Retrospect 1.2 w/Remote .. 264.

Dariana Technology Group
- Mac Sleuth System Profiler . 85.

Dublclick Software
- ClickChange ..... 40.
- MenuFonts 3.0 ..... 28.

Fifth Generation
- Disklock 2.0 ..... 117.
- Fast Back II 2.5 ..... 117.
- Powerstation 2.5 ..... 33.
- Pyro! 4.0 ..... 24.
- Suitcase II 1.2 ..... 48.
- SuperLaserSpooler 2.02 ..... 92.
- SuperSpool 5.0 ..... 61.

ICOM Simulations
- Mac Kern ..... 58.
- On Cue 1.3 ..... 34.

Insight Development Corp
- MacPrint 1.2 ..... 93.

Kent Marsh
- FolderBolt ..... 106.
- Macsafe II ..... 106.
- Night Watch ..... 84.
- Quicklock 2.0 ..... 56.

Kiwi Software
- Kiwi Finder Extender ..... 64.

Magic Software
- Auto Save II ..... 26.
- Backmatic ..... 49.

Mainstay
- Marco Polo 151
- Mark Up - Single ..... 157.

Microcom
- 911 Utilities ..... 88.
- Virex 3.1 56

Microseeds Publishing
- Screen Gems ..... 38.
- INIT Picker 2.0 ..... 35.
- Redux ..... 48.
- Rival ..... 48.

Now Software
- Now Utilities ..... 74.

On Technology
- On Location 74

Ontrack
- Disk Manager Mac ..... 35.

Preferred Publishers
- Screen Shot ..... 30.
- Personality ..... 48.

Salient
- Disk Doubler 3.0 ..... 43.

Softview
- MacInUse ..... 59.

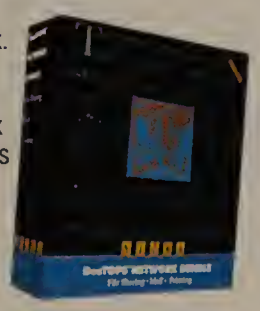
Symantec
- S.A.M. 3.0 ..... 64.
- S.U.M. II ..... 95.
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Tactic Software
- MasterFinder ..... 49.

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- Scan 300/color ..... 1895.
- Laserscript LX ..... 1995.

Advanced Gravis
- SuperMouse ..... 89.
- MouseStick (512 or ADB) .... 63.

Altra
- Felix ..... 116.

Animas
- Hand Held Color Scanner .. 575.

Articulate Systems Inc.
- Voice Link ..... 199.
- Voice Navigator II ..... 495.

DataDesk
- Switchboard ..... 158.
- SwitchboardTrack Ball ..... 97.

Dest
- Scanner W/Recognize ..... 685.

Farallon
- MacRecorder 2.0 ..... 158.
- Voice Digitizer ..... 88.

Hewlett Packard
- Deskwriter (300 DPI) Printer 758.

Kensington
- Turbo Mouse (512K & Plus) 107.
- Turbo Mouse ADB ..... 107.

Keytronics
- Mac Pro KB-105 Plus ..... 144.

Kodak
- Diconix B&W Printer ..... 398.
- Diconix Color Printer ..... 1,100.

Kurta
- 8.5 x 11 Tablet ..... 318.

Logitech
- Scanman Model 32 ..... 298.

Microtek
- 300ZS ScannerColor/Gray 1935.
- 300GS Scanner Gray ..... 1325.

Micro Touch Systems
- UnMouse ..... 188.

MicroSpeed Inc.
- MacTRAC (512/Plus) ..... 60.
- MacTRAC TrackBall ADB ..... 74.

Mouse Systems
- Little Mouse A+ (512/Plus) .. 74.
- Little Mouse For ADB ..... 74.

Olduvai
- Read It! OCR 2.1 ..... 277.
- Read It! Personal 2.1 ..... 168.

The Complete PC
- Full-page Scanner ..... 757.
- Half-page Scanner ..... 294.

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- ThunderScan Plus ..... 198.
- Lightning Scan 400 ..... 384.

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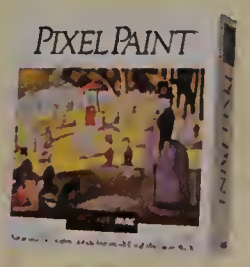
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Activision
Cosmic Osmo CD ROM ..... 45.
Manhole CD ROM ..... 33.

Aldus/Silicon Beach
Super Card 1.5 ..... 198.

Claris
HyperCard 2.0 Dev. Kit ..... 139.

Farallon - Media Tracks
Multimedia CD ROM ..... 318.

Hyperglot Software Co.
Learn to Speak Spanish ..... 60.
Learn to Speak French ..... 60.

HyperPress Publishing
Icon Factory 1.1 ..... 44.
Script Expert 1.0 ..... 44.
Script Library 2.0 ..... 56.

ICOM Simulations
Hypertmon ..... 57.

Individual Software
Power Macros/HyperCard ... 34.

Microsoft Corporation
Office CD ROM ..... 598.

Motion Works
ADDMotion ..... 182.

QLTech (Quantum Leap)
Macadamia CD-ROM ..... 73.
GigaROM CD-ROM ..... 98.
CD7 CD-ROM ..... 49.

Somak
Script Edit ..... 43.

Wayzata Technology Inc.
Middle East Diary ..... 85.
All Of Mac Tutor ..... 155.
Baseball Guide& Reg ..... 155.
CD Funhouse ..... 39.
Disc Tracy Prog Detec ..... 85.

Wayzata Technology Inc.
GEM (Public Domain) ..... 78.
Quick Art ..... 174.
Seals Of The US Govt. ..... 55.
The CIA World Factbook ..... 78.
The USA Factbook 1990 ..... 85.

ENTERTAINMENT

Accolade
Stratego ..... 29.

Brøderbund
Sim Earth ..... 39.
Robo Sport ..... 35.

Casady & Greene
Sky Shadow ..... 28.
Mission Starlight ..... 28.

Electronic Arts
Weaver Baseball 1.5 ..... 33.

FTL Games/Software Heaven
OIDS ..... 29.

Inline Design
Darwin's Dilemma ..... 31.
Tesserae ..... 31.

Toyogo
Nemisis Deluxe ..... 84.

XOR
NFL Challenge ..... 54.
MacSki ..... 38.

EDUCATION

Addison-Wesley
Inside Mac Vol 1 - 5 ..... 18.
Inside Mac X-ref ..... 8.
MacProgramming Primer .... 21.
MacProgramming Secrets .. 19.
Programmers Online Companion 2 ..... 35.

Bantam-Double Day-Dell
Illustrator Design Hndbk ..... 22.
HyperCard Handbook 2.0 .... 21.
Mastering WingZ ..... 17.

Beacon

Carina Software
Voyager 1.2 ..... 86.

Davidson & Associates
Alge Blaster Algebra Plus .... 35.
Math Blaster Mystery ..... 29.

Earthquest, Inc.
Earthquest ..... 48.

Goldstein & Blair
Mac Bible/What Do I Do/Sof 33.
Mac Bible + What Do I Do .... 27.
Macintosh Bible 3rd Ed. ..... 19.

Great Wave
KidsMath/Kids Time ..... ea. 25.
NumberMaze B&W ..... ea. 25.

Hyperglot Software Co.
Spanish, French, German , Italian, Russian
Word Torture 4.0 ..... ea. 34.
Spanish, French, German
Pronunciation Tutor ..... ea. 34.
Verb Tutor ..... ea. 38.
Spanish, French
Tense Tutor ..... ea.38.
Intro to Russian ..... 28.
Russian Verbal Aspects ..... 41.
Russian Noun Tutor ..... 58.
Japanese Easy Kana ..... 128.
Japanese Karji Master ..... 98.

Individual Software
Training for PageMaker 4.0 . 34.
Professor Mac ..... 29.

Individual Software
Typing Encore 3.5 ..... 17.

Learning Company
Math Rabbit ..... 30.
Reader Rabbit 2.2 ..... 30.

MECC
Oregon Trail ..... 28.
Word or Number Munchers . 28.

Nordic Software
MacKids Preschool pack ..... 35.
Turbo Math Facts ..... 21.
Word Quest ..... 30.

Penton Overseas -Vocabulear
French 1 or 2 ..... 35.
German 1 or 2 ..... 35.
Italian 1 or 2 ..... 35.
Japanese 1 or 2 ..... 35.
Spanish 1 or 2 ..... 35.

Personal Training Systems
Tutorials for:
HyperCard 2.0 ..... 51.
FileMaker Pro ..... 51.
QuarkXPress3.0 ..... 51.
PageMaker 4.0 ..... 51.
Freehand ..... 51.
Persuasion ..... 51.
Excel ..... 51.
Word ..... 51.
Works ..... 51.
Mac Basics ..... 51.

Simon and Schuster
Typing Tutor IV ..... 28.

The Software Toolworks
Mavis Beacon Teaches Typing ..... 31.

Visionary Software
Synchronicity ..... 38.

Zondervan
mac Bible NIV, KJV, RSV ..... 58.
mac Bible Greek, Hebrew ..... 98.

MULTI-MEDIA

Aapps
DigiVideo - B&W ..... 348.

Bright Star
Hyper Animator 1.5.2 ..... 97.
Interface ..... 248.

Farallon
Multimedia Pack ..... 318.
Meoia Tracks ..... 188.

Gold Disk
Animation Works ..... 148.

MASS Microsystems
QuickImage 24 748

Digital Vision
Computer Eyes - Color ..... 348.

Digital Vision
Computereyes - B/W ..... 194.

MacroMind
MacroMind Accelerator ..... 124.
MacroMind Director 2.0 .... 437.
MacroMind Media Maker ... 325.

Paracomp
Film Maker ..... 434.

Raster Ops
ColorBoards 364
w/Director 2.0 ..... 1,295.

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3.5" HD 1.44Mb. ..... 228.

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20 Mb Ext ..... 328.
30 Mb Ext ..... 388.
45 Mb Ext ..... 438.
60 Mb Ext ..... 488.
80 Mb Ext ..... 528.
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DaynaFile II 1.44Mb ..... 445.

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40 Mb ..... 349.
105 Mb ..... 529.

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PRO Drive Series
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130 Mb ..... 595.
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50 Mb ..... 479.
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120 Mb ..... 739.

La Cie Limited
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Tsunami 50 Mb LPS ..... 645.
Tsunami 80 Mb ..... 815.
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Plus 45 Mb Ext ..... 449.

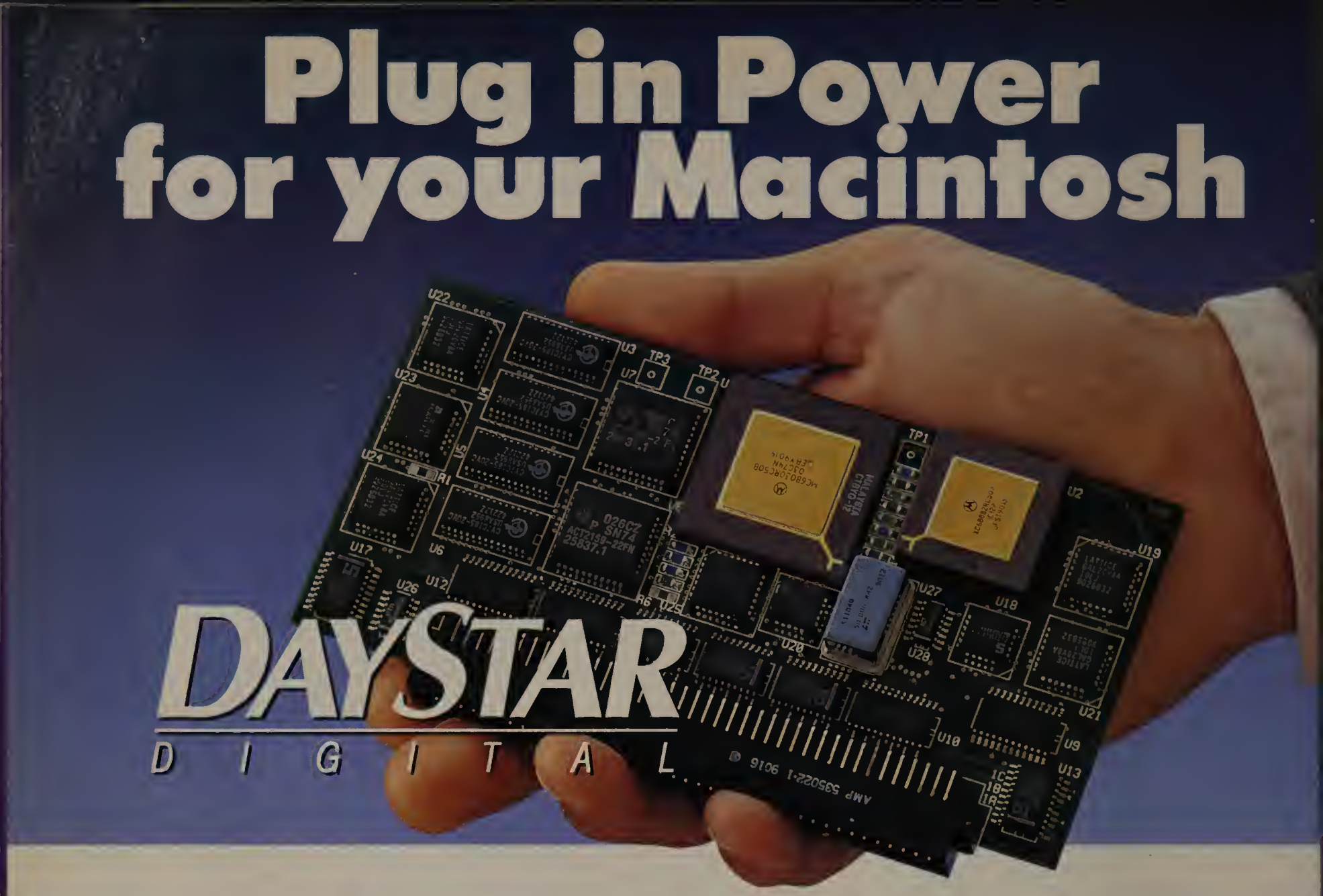
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Circle 70 on reader service card

cation is best seen in the circulation of Larry Seiler's missive. Besides sending it to Lotus, he posted it on an electronic forum, allowing people to copy it and send it to friends on other interconnected networks. As a result, the letter was seen by thousands of people. Within days, more than 100 people sent personal responses to Seiler. The responses came from as far as Saudi Arabia.

Sure, some of the remarks made about Marketplace on the computer nets weren't totally accurate. But generally, mistakes were quickly corrected by subsequent postings made by more meticulous critics. For many readers, it was an educational process—not only about Marketplace, but about the ready availability of personal information to those willing to pay for it.

And true to Alan Westin's survey results, people didn't like it. A lot of them hated it. In light of that, and of the fact that these people reflected the feelings of the public at large, Lotus and Equifax had to face up to destiny and pull the plug on Marketplace. The product wasn't the core business of either company, and it was drawing bad press and bad feelings. (Lotus was particularly concerned that many of the angry responses were from its spreadsheet customers.) Trying to save it would have required adjusted opt-out procedures and possibly even a rewrite for encryption—thus lowering the expected payoff for an investment that was far from a sure thing. (An earlier, less controversial variation of the product, which offered lists of businesses rather than consumers, was selling dismally.)

The Lesson

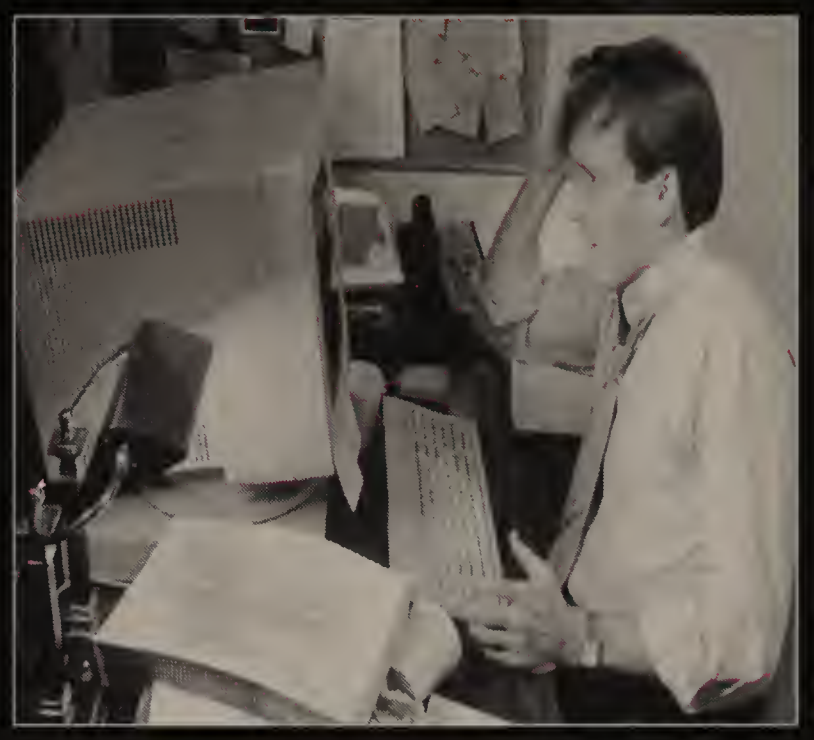
Is there a lesson? Lotus's Dan Schimmel doesn't draw any big conclusions from the experience—he just says the timing was wrong. But I think more than that was wrong.

Lotus is supposed to be a company that understands how personal computers empower people and improve their lives. In this case, it missed the boat. Though Marketplace ostensibly decentralized and made more accessible direct-mail marketing, a formerly elite activity, the product's eventual effect would decrease the power of individuals, specifically their ability to maintain privacy. The consequences are more than extra junk mail and the potential for misuse. By packaging us on CD ROM and selling us, Marketplace dehumanizes us.

Larry Seiler recognized this immediately, as did the thousands who opted out of Marketplace. Along with the consumer advocates and the media, they made Marketplace into a lightning rod for dissatisfaction about the use of personal data. And as Alan Westin puts it, "You don't stand up in a storm and hold a lightning rod unless you're a masochist." ◘

Macworld columnist Steven Levy is writing a book on artificial life.

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Output Resolution:
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Line Screen: 150 lpi

Gamma Correction:
None





Silverscanner

Original
8 x 10 B&W print

Brightness level:
default

Input resolution:
150 dpi

Size: 388K

Output Resolution:
200 dpi

Line Screen: 150 lpi

Gamma Correction:
None

Microtek Scan

Original:
8 x 10 color print

Brightness level:
default

Input resolution:
150 dpi

Size: 1103K

Output Resolution:
200 dpi

Line Screen: 150 lpi

Color Correction:
None





Silverscanner

Original:
8 x 10 color print

Brightness level:
default

Input resolution:
150 dpi

Size: 1112K

Output Resolution:
200 dpi

Line Screen: 150 lpi

Color Correction:
None

When it comes to selecting the right scanner, be forewarned. There is a difference you can see in black and white. And color. Just look at this comparison between the La Cie Silverscanner and the Microtek 300ZS. Both images were scanned at default settings with no corrections. This entire ad was then created and separated using Adobe Photoshop, Quark XPress 3.0 and a Linotronic 330.

As you can see, Silverscanner produced a better-looking image than the Microtek scan. Silverscanner lets you scan color, gray-scale, halftone and line art with dazzling clarity. La Cie gives you more with OCR compatability, faster color previews, versatile scanning controls and up to 1200 dpi.

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Circle 195 on reader service card



Accessible Computing

INNOVATIVE PRODUCTS FOR MACINTOSH USERS WITH DISABILITIES

BY DEBORAH BRANSCUM

A growing body of adaptive devices is making the Mac more accessible to a broad range of users. Some are flexible, mainstream products, while others are designed specifically for disabled individuals. "I'm trying to eliminate the line between 'disabled' and 'nondisabled' and instead to support anything that genuinely accommodates the range of human ability," says Jane Berliss, database coordinator at the Trace Research & Development Center at the University of Wisconsin in Madison.

Berliss cites the MousePen Professional, from Appoint (805/239-8976 or 800/448-1184), as one example of a product with broad appeal. "It looks and acts like a fat ballpoint, which is very useful for people who have limited mousing space, like wheelchair users who would have an easier time mousing on their own leg than on a table." Portable computer users may also find the product useful. According to Appoint, the $99 MousePen Professional can move the cursor across a display using a space smaller than a business card.

Another flexible input device is the MVP Mouse from Curtis (603/532-4123). This $149.95 three-button trackball has a $29.95 foot-switch option that works as a fourth, programmable button. Users with cumulative trauma disorders of the hand or arm might find it useful to substitute foot-switch clicks for mouse clicks.

People who have limited mobility (or who simply prefer to compute from a Barcalounger) might like the Mouse Lap Pad, from PrecisionLine (612/475-3550 or 800/328-0077). This mundane but useful item is a standard mouse pad in a rigid plastic tray that attaches to a user's knee or thigh. Two stretch straps with plastic buckles keep the Lap Pad in place.



ROBERT HOLMGREN

Heather Hendrickson and her mother explore computers at the Special Technology Center of Mountain View, California.

Under Development

The converted garage of a Palo Alto, California, home is headquarters for Zofcom. This five-person enterprise is working on a promising product for individuals with spinal-cord injuries. The TongueTouch Keypad and Zofcom Control System sounds weird but works wonderfully to give wheelchair-bound users control over their environment.

The custom device fits into the upper palate of a user's mouth, much like a dental retainer. The keypad has a grid of nine switches that are activated by the tongue and powered by a tiny battery that sends radio frequencies to a control that in turn sends infrared signals to a receiver connected to the Macintosh and other devices. With this system, a user can make phone calls, watch TV, and work on a Mac.

The company hopes its $5250 system, which is being tested at a local VA hospital and junior college, will receive FDA approval sometime in May. Unlike existing systems, Zof-

(continues)



GEOFFREY NELSON

The TongueTouch Keypad fits like a dental retainer. With the controller device and software, users can control a Mac and much more.

com's product doesn't tether users to an input device. "We've made kids mobile," says cofounder Daniel Fortune. Young college students testing the product appreciate the system's elegance and invisibility, Fortune says.

Another project under development at the Trace Center is System 3. "Over the next five years, there might be a complete transition to graphical user interfaces," says Peter Borden, the communications director for the Trace Center. That may be good news to many users, but it is a problem for blind individuals, who can find the Mac a nightmare to navigate.

In conjunction with Apple and several other companies, Trace is creating a prototype system built around the Macintosh that uses Berkeley Systems' outSpoken screen-reading program. outSpoken enables blind users to navigate through the Mac interface and applications using a numeric keypad. Trace's System 3 prototype explores three forms of screen access. The first uses outSpoken with a keypad (or with Articulate Systems' Voice Navigator for voice input). The second offers faster access by supplanting the keypad or Voice Navigator with a touch tablet that offers so-called speed lists—areas of the tablet that represent menus and messages. The third uses a graphics tablet with tactile feedback. Trace built a special puck, a CAD/CAM control device, that "determines your position on the graphics pad and also has a little array of vibrating dots," says Borden. "As you hold the puck, you put your index finger on the array of dots, which vibrate in a particular way. You can feel all the images on the screen, one small area at a time."

According to Wes Boyd, president of Berkeley Systems, "Braille is a very effective way of scanning information. The problem is that the computer devices for displaying braille are expensive and can only display 20 characters at a time." The graphic puck is a technological compromise that helps open up the human interface. System 3 is strictly a research prototype, but the project may help Berkeley Systems extend outSpoken or develop related commercial products over the next year, Boyd says.

Finding Help

Alan Brightman, the director of Apple Computer's Worldwide Disability Group, is bright, opinionated, and full of facts. In this country, he tells me, there are more than 43 million dis-

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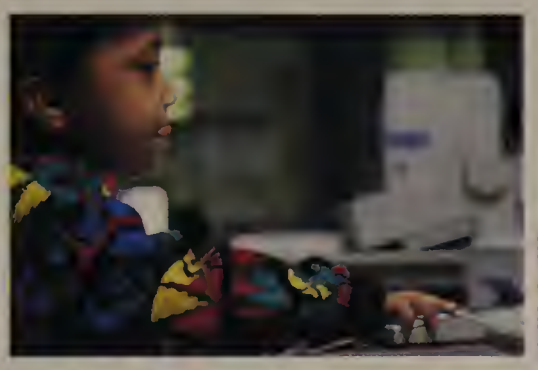
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abled individuals, most of them disabled as a result of accident or illness. Many of these people might benefit from using a computer for both special and standard needs. But unfortunately, there is no magic wand, no single Mac solution for any given disability, says Brightman, no perfect program for students with learning disabilities, for example, or for users who cannot type on conventional keyboards. Instead, there is a range of solutions that individuals must explore in order to discover those products that fit their needs.

Apple can help steer people in the right direction through its **Worldwide Disability Solutions Group** (408/974-7010 or 800/732-3131, ext. 950; TDD access at 408/974-7911). The group publishes *Connections* and *Toward Independence,* brochures that list some useful organizations, books, publications, and adaptive products. Both are available at no charge. A HyperCard database called Solutions lists adaptive devices for the Macintosh and is available on AppleLink, which can be accessed through authorized Apple dealers.



ROBERT HOLMGREN

Jarrod Avila plays intently during a Tech for Tots session at the Special Technology Center (415/961-6789) of Mountain View, California.

"If you want to make a good decision, you have to learn a lot," says Trace's Borden. "Grass-roots organizations are good. They consist of people who've had to confront the issue from the perspective of the consumer." The **Trace Research & Development Center** (609/262-6966) is a good place to start. The center acts as information central when it comes to communication and computer-access systems available to disabled individuals.

Other organizations also make the search easier. **The Alliance for Technology Access,** a network of 45 computer resource centers in 34 states, was started in 1987 by the Disabled Children's Computer Group of Berkeley, California, and Apple Computer. These grass-roots centers generally offer assistance, referrals, and a place for users to try computers, adaptive devices, and software in a supportive environment. National offices are located in Albany, California (415/528-0747), and Lexington, Massachusetts (617/863-9966); both can refer callers to a regional center.

Abledata (203/667-5405 or 800/344-5405) is a large, government-funded database maintained by the **Adaptive Equipment Center** of the Newington Children's Hospital of Newington, Connecticut. Abledata goes far beyond computer-related devices and lists more than 17,000

(continues)

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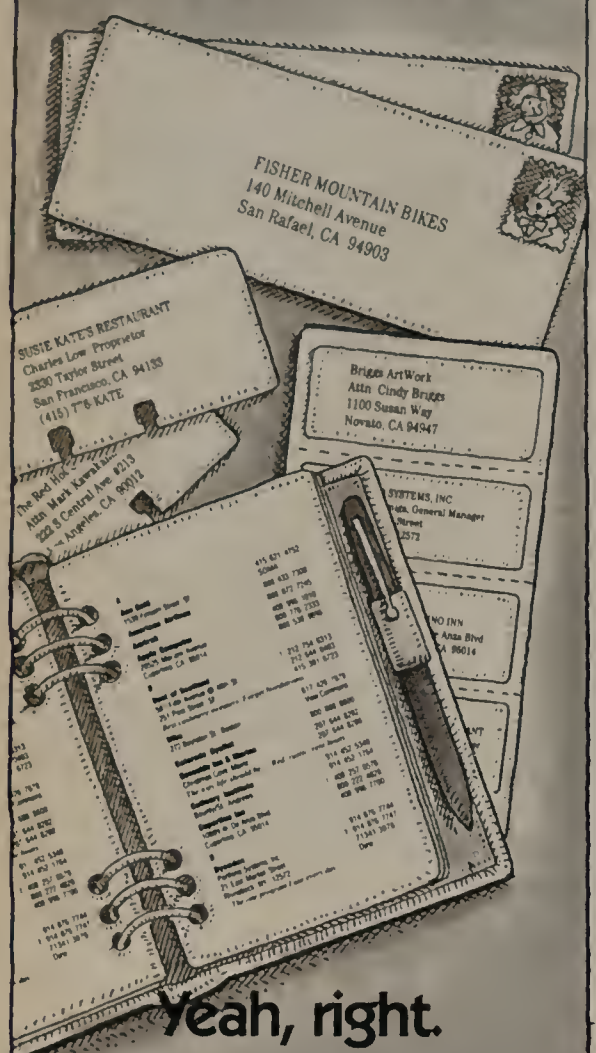
TEXAS INSTRUMENTS

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Circle 198 on reader service card.

SERVICE HERO

Mark Middleton, president of the Buckeye Mac User Group, writes about buying a used RasterOps ColorBoard for an SE/30 by mail for his club. When it arrived, "it had no documentation, no parts, no software." The mail-order company was no help, so he tried working with a local dealer. That went nowhere fast; finally he called RasterOps. Tech support promised to send the parts ASAP. "They called me back in a few minutes and told me there would be no charge. A few days later the parts, software, and manual arrived, including a new ROM chip to upgrade my old chip."

products. Information specialists help users define their requests by type of product or type of activity or function that users want to achieve. The sample 14-page printout I received listed macro programs, a braille translator, a HyperCard-based MacinTalk communication program, and much more. Abledata searches of up to 8 pages of hard copy are free; prices range from $10 for 9 to 15 pages of citations to $35 for 76 to 90 pages.

Closing the Gap (612/248-3294) publishes a respected newsletter in the field and an annual resource directory of hardware and software vendors. The latest version is available for $14.95 (includes shipping and handling) from Closing the Gap, P.O. Box 68, Henderson, MN 56044. The organization also sponsors workshops and an annual conference where new technology often debuts. The next conference is scheduled for October 17 through 19. A newer but also well-known conference is sponsored each spring by **California State University at Northridge**; the organizer, Dr. Harry Murphy (818/885-2578), can offer details.

Some online services have disability-related areas, including America Online (800/227-6364 ext. 5257), BIX (603/924-9281), CompuServe (617/457-8600), Delphi (617/491-3393), and GEnie (301/340-4000). Dr. Edward Del Grosso maintains a list of private bulletin boards, including special-needs BBSs, on the **Black Bag BBS** (302/731-1998; Fidonet Node 150/140).

Finally, computer equipment that leads to more independence is often expensive. A new national revolving loan program overseen by Easter Seals may help. **The Technology Related Loan Fund** plans some 40 loans (from $1000 to $3200) at 11 percent interest to people with disabilities for purchasing computer-related systems, software, or related technology. The deadline for applying is September 1. Contact Sully JF Alvarado at 312/667-8400 (voice and TDD).

June Events and More

Programmers and users gather at two separate events this month.

At MacHack, June 19 through 22, a frenzy of technonerds will compete to write the best hack, bash Apple, and swap tales. This annual event takes place at the Ann Arbor, Michigan, Holiday Inn West. Registration is $345; call 313/882-1824 for details.

The National Apple Users Group Conference takes place June 7 to 9 at the University of California at Berkeley. User-group activist and NAUGC organizer Raines Cohen says conference attendance will cost no more than $70, including meals; dorm rooms will be extra, but less expensive than hotels. Vendors are encouraged to cosponsor the event. Call 415/215-9550 for more details or contact Raines via AppleLink at NAUGC.

Speaking of user groups, Apple's User Group Connection (408/974-4060) just completed a workplace edition of *Just Add Water,* a guide to starting user groups. This book should be a great help to anyone starting a group on the job. (A community version is also available.) ■

(Research assistance by Carolyn Bickford.)

. . . . . .

Send nominees for sainthood to Service Heroes, Macworld, *501 Second St., San Francisco, CA 94107 or via AppleLink (Macworld1). Conversely, drop* Conspicuous Consumer *a line if a company is ignoring you.*

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MACWORLD NEWS

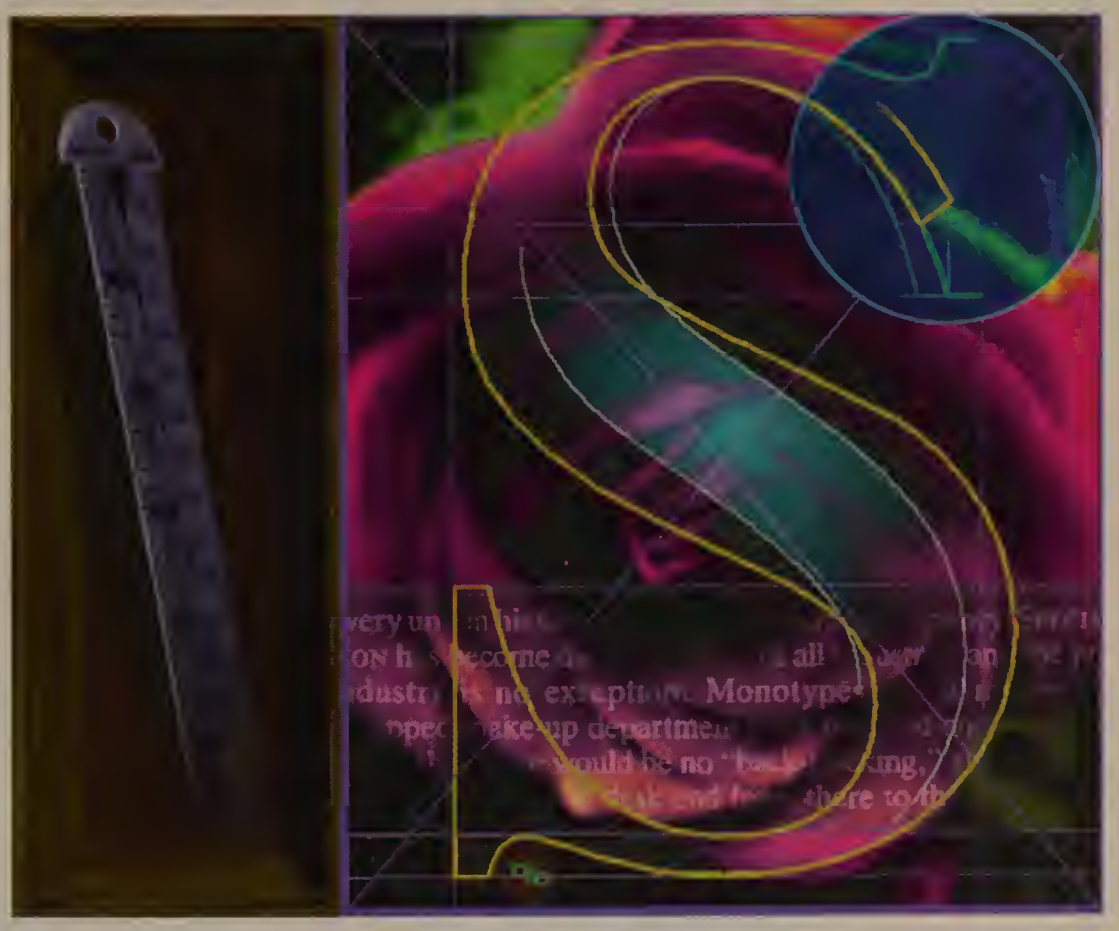
by Dan Littman and Tom Moran

A Rose at Any Other Size . . .

Digital typography has taken a great leap forward by reinstating an old tradition. In the days of metal type, a given typeface's 6-point *a* might look considerably different from its 24-point *a*. At small sizes, characters need thicker stems, more-pronounced serifs, a larger width, and a greater x-height to hold their own on the printed page. This typographic subtlety—known as optical scaling or visual scaling—was lost when digital type came along; today, a 6-point character and a 600-point character are derived from the same outline.

Adobe's new Multiple Master typeface technology makes optical scaling possible by allowing users to change characteristics such as weight, width, size, and style within a matrix of designs provided by the designer. In a simple matrix, you could choose among dozens of intermediate weights between an ultralight weight and an ultrabold. In a more complex matrix, you could alter both weight and width, going from a light condensed character to a black expanded one. Adventurous typographers might even provide a transition between a serif and a sans serif face.

Multiple Masters alleviate another shortcoming of current digital fonts: the limited number of weights available in most families. Multiple Masters can also aid in copyfitting, as designers can adjust not only the space between characters but also the width of the characters themselves. Adobe will offer several Multiple Master faces, and companies that license Adobe's technology may offer them as well.



ERIC ADIGARD

While waiting for applications to provide an interface to Multiple Master fonts, Adobe will bundle a utility with the fonts for adjusting factors such as weight and width. Multiple Master fonts should be available in late 1991. Pricing wasn't set at press time. Adobe is in Mountain View, California, at 415/961-4400.—**Erfert Fenton**

Pictures at a Warehouse

Three companies have big plans for their Macintosh art-archiving utilities, but a fourth company is dropping its product from the market.

Version 2.0 of Mariah, written by Interactive Media Technology and published by Symmetry, will archive and preview animation and sound and support Photoshop, some CAD formats, and many word processors (it will index and search the contents of text files). The new version will let you batch-assign keywords, search keyword indexes of unmounted volumes, refine search filters up to five levels deep, and save queries for reuse. Version 2.0 will probably list for less than $200. A later version will also support 3-D formats. Symmetry is in Scottsdale, Arizona, at 602/998-9106.

Taking the long view, the developers of Multi-Ad Search are working with Apple to define a System 7.0 AppleEvent called Place, which would standardize how programs use files created in other formats; the Multi-Ad people are also trying to persuade Apple to develop a thumbnail resource. Meanwhile, version 1.5 of Multi-Ad Search adds support for all Photoshop formats; incorporates Storm Technology's JPEG++ technology for lossy compression and

(continues)

Over 6 Billion Bytes Served

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The REO-6500 is the perfect solution for providing a centralized data storage system which is ideal for storing on-line, network, or backed up databases.

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Circle 266 on reader service card

DiskDoubler and DoubleUp lossless compression; is able to launch a creating application to open a file; and will understand System 7.0's alias scheme. Version 1.5 will list for $249. Multi-Ad Services is in Peoria, Illinois, at 309/692-1530.

Loop Software's PictureBook (once published by Symmetry) is being upgraded to PictureBook+. The new version lets you drag images between archives; provides keyword searching; batch-imports text, PICT, paint, and EPS files; and resizes images on the Clipboard using macros. Loop is also developing a high-end archiver called ArtGallery, which can read external files without importing them; lets you stick notes on an image; and has layout tools for printing thumbnails, notes, and catalogs. Loop Software is in Menlo Park, California, at 415/326-4803.

These products lack the one feature necessary to transcend being an electronic portfolio and become a database for art: user-definable fields (Mariah might support them in version 2.1). With that feature, a gallery could print thumbnails of a single artist's works sold in 1990, a paste-up artist could select clip art of vegetables on a blue background, or magazines could include a photographer's contract next to thumbnails from a photo shoot.

Solutions Inc. has discontinued the aging Curator and hopes to find a way for Curator users to migrate to another product. Solutions is in Williston, Vermont, at 802/658-5506. **—D.L.**

SyQuest Unveils 88MB Removable-Cartridge Drive

SyQuest Technology recently introduced its SQ5110, a removable-cartridge drive that offers 88MB of formatted capacity, twice the storage of the company's extremely popular 44MB SQ555 drive. At the same time, three companies—Mass Microsystems, MicroNet Technology, and Peripheral Land Inc. (PLI)—said they will offer drives using the new SyQuest mechanism.

The SQ5110 has a 20ms average access time and can support data transfer at up to 4MB per second over SCSI. The SQ5110 can read 44MB cartridges from SQ555 drives but cannot write to them. The SQ5110 also features automatic parking and locking of the read-write heads.

Mass Microsystems will call its family of SQ5110-based drives the DataPak 88 series. The series will include two dual-drive models and other models with footprints for different Macs. The drives will have external SCSI switches, two AC outlets, and external SCSI termination. The company will include PadLok, its volume-partitioning software, and Salient's DiskDoubler file-compression software. Prices and availability weren't set at press time; but Mass Microsystems expects the suggested retail price of the single-drive models to be under $2000. Limited numbers should begin shipping in March.



ANNE NADLER

SyQuest drives from top to bottom: the Mass Microsystems DataPak 88, the MicroNet MR-90R, and the PLI Infinity 88 Turbo.

MicroNet will call its drive the MR-90 and offer it in versions for the Macintosh and for IBM PCs. The company said the drive will format to 84MB for the Mac and to 88MB for PCs. The drive will retail for $1795 for the Mac and should be available beginning in March. MicroNet will also offer the MR-90R, which will come with Retrospect Remote, backup software from Dantz Development, and will retail for $1995.

PLI has named its version of the drive the Infinity 88 Turbo. PLI says its drive formats to 85.3MB and supports SCSI-1 and SCSI-2, the latter with the addition of an optional NuBus board. The Infinity 88 Turbo has external termination, an external SCSI ID switch, and a metal case. PLI includes utility software for backups, disk optimizing, print spooling, and disk caching. The company said that the drive had begun shipping at the beginning of April at a retail price around $1900.

SyQuest said it expected to begin volume shipments of the mechanism in June. For more information, contact MicroNet in Irvine, California, at 714/837-6033; PLI in Fremont, California, at 415/657-2211 or 800/288-8754; or Mass Microsystems in Sunnyvale, California, at 408/522-1200. **—T.M.**

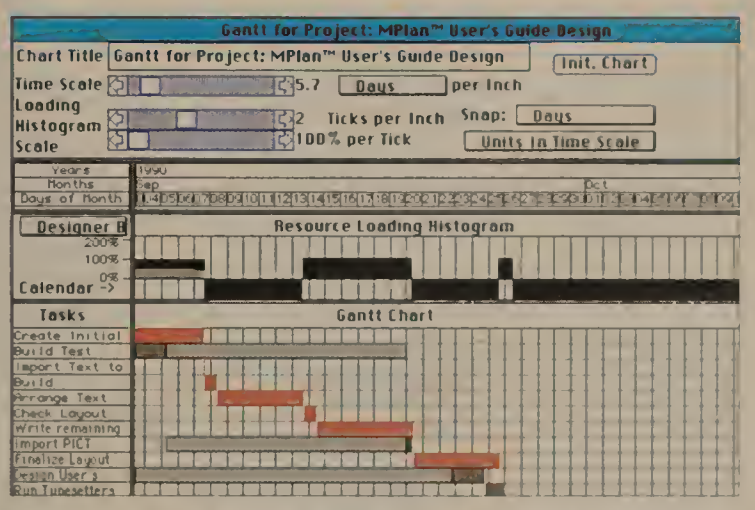
A New Kind of Plan

Accounting software vendors used to claim that their customers really didn't want accounting software with a Macintosh interface—until products like AtOnce and Accountant, Inc. put a halt to that gibberish. Now San Francisco start-up New Latitudes plans to do the same for project managers with MasterPlan.

Covering MasterPlan's full feature set is a highly accessible interface. It has only three menus—almost everything is available at surface level in the Project, Task, and Resource windows. In the Task window, for example, a pop-up list of resources and a percent-allocated slider let you assign multiple resources at different load levels without leaving the window.

MasterPlan provides a lot of high-end features. You can define every resource with a different calendar—

(continues)



MasterPlan: The line dividing Gantt chart and Resource Histogram can be moved to reveal more of either chart.

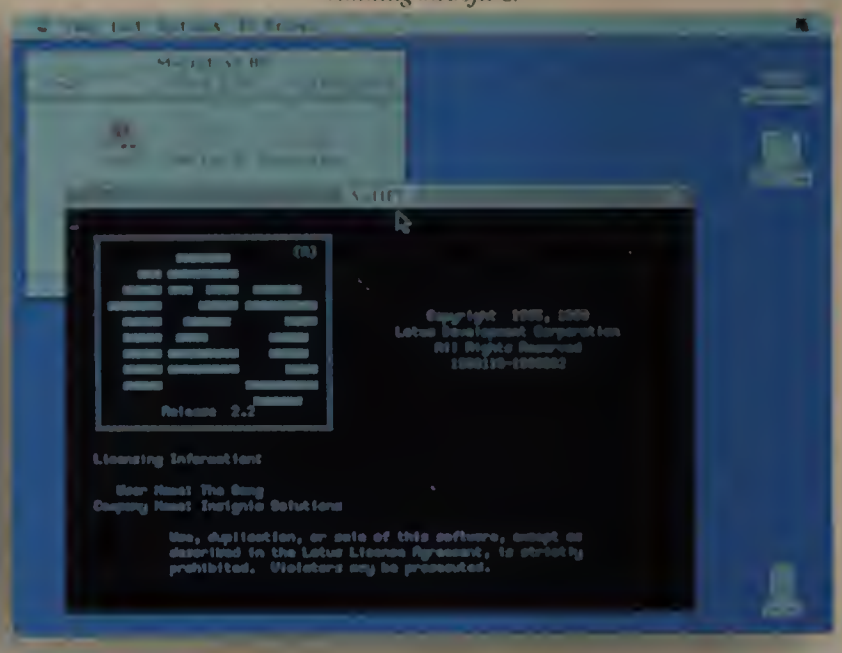
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Circle 72 on reader service card



PHOTOGRAPH BY LUIS DELGADO; SCREEN IMAGE BY MARK JASIN

The Radius Color Pivot is a 15-inch color monitor that turns from landscape mode to portrait mode. With various adapter boards it can work with all currently shipping color Macs.

for example, schedule some tasks in a country with a six-day workweek and others on a mainframe computer that you pay for by the second. (The calendar suffers from a bizarre outliner-like interface in which units of time, from years to seconds, are stacked up above a horizontal scroll bar.) MasterPlan can also handle derated resources, such as a worker who is paid the same as his peers but has significantly lower productivity.

Resources can be combined in teams, and team members can belong to several teams assigned to several tasks. Fortunately, MasterPlan has automatic resource-leveling. (It doesn't yet provide interactive leveling, but a check box in the task dialog box lets you exempt critical tasks from being automatically crunched.)

MasterPlan also has a full set of charts, cost-analysis tools (a later version will provide inflation-adjustment), and PERT-like "what-if" capability. MasterPlan can schedule from start to finish or from finish to start, and it lets you switch back and forth to hunt for bottlenecks. It also has a continuous backup feature that protects data files against crashes.

MasterPlan will list for $249. For more information, contact New Latitudes at 415 563-8727.—**D.L.**

Color Takes Its Turn

Following up its popular monochrome Pivot display, Radius has introduced the Radius Color Pivot, a 15-inch color monitor that instantly swivels back and forth between portrait mode and landscape mode. In portrait mode, the Color Pivot displays a full page for applications such as word processing and page layout. In landscape mode the monitor is more useful for spreadsheets.

The monitor works with any of Apple's current color Macs and does not require a graphics adapter to provide 16 colors in conjunction with the built-in video of the Mac IIci and IIsi (but not the LC). To achieve the monitor's full 256-color capability, a Radius Color Pivot Interface is required. The interface boards are functionally identical but differ in physical format for the NuBus machines, the IIsi, the LC, and the SE/30.

The interface boards also provide two resolution modes: full-page at 82 dpi for viewing an entire document; and actual size at 72 dpi for WYSIWYG. The monitor's resolution is 640 by 870 in full-page mode, and 564 by 760 in actual-size mode. Radius says it has solved the color-convergence problems that made the Color Pivot more difficult to manufacture than the monochrome Pivot.

The Radius Color Pivot monitor and the Color Pivot Interfaces are all currently available. The monitor lists for $1995, while the interfaces all retail for $795, except for an entry-level, 2-bit version of the interface for the LC. The entry-level LC version lists for $395 and can be expanded to 8-bit by purchasing the Pivot LC Memory Upgrade Kit for $400 list. The interface board for the IIsi has a pass-through processor-direct slot so that users can add another board, such as an Ethernet board. For more information, contact Radius in San Jose, California, at 408/434-1010.—**T.M.**

(continues)

Radius Color Pivot Configurations

Computer	for 16 colors	for 256 colors
Mac II, IIcx, IIx, IIfx	NA	Interface for the Mac II
Mac IIci	Software	Interface for the Mac II
Mac IIsi	Software	Interface for the Mac IIsi
Mac LC	NA	Interface for the Mac LC
Mac SE/30	NA	Interface for the Mac SE/30

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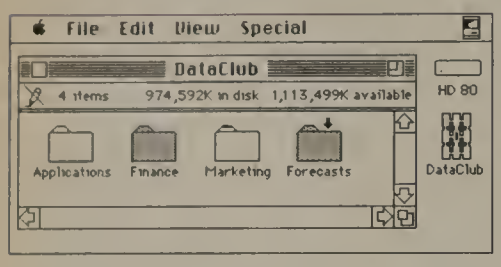
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DataClub™ is a breakthrough in file server software. It overcomes the limitations of TOPS'* conventional peer-to-peer architecture to give you a network that's more powerful, more reliable, easier to use, and easier to expand.

The key is DataClub's new Virtual Server™ technology, which uses available resources around the network to create one powerful, shared disk that is centrally managed and maintained. And this makes a big difference for you.

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Folders are always available	DataClub gives users access to the entire shared file system 100% of the time.	On a TOPS network, mounted folders disappear when machines shut down or leave the network.
Files are easy to get to	All files and folders are found under the single DataClub icon.	With TOPS you have to spend valuable time mounting and searching multiple volumes.
Location transparency	DataClub's Virtual Server technology allows users to access data without having to know on which machine it's physically stored.	TOPS users must know where a file is physically stored in order to access it.
No need for publishing	Just store files under the DataClub icon, and they're available to the network.	TOPS requires all data to be published before it can be shared.
Unlimited scalability	Thanks to its Virtual Server technology, an expanding DataClub network retains its simplicity and actually grows more powerful.	As peer-to-peer systems like TOPS grow, they become more and more unmanageable.
Add users without reconfiguring	DataClub automatically reconfigures the network whenever hardware is added or removed.	On a TOPS network, users have to mount volumes manually every time a new user or disk is added.
Centralized backup	You can back up a DataClub network quickly, easily, and more often – because all shared information can be backed up from any Mac, at any time, without interruption to the system.	By contrast, TOPS requires individual back up of each node.
Nine levels of security options	DataClub provides the highest Apple-approved security you can get – nine levels.	TOPS offers just one.
One password per user	With DataClub you only need one password per user.	With TOPS you need a different password for each folder, adding more confusion than security.
Centralized registered users	DataClub lets you create a single set of users and groups which is valid for all Macs and disks on the network.	TOPS has no support for registered users and groups.
Complete AFP compliance	DataClub complies fully with the AppleTalk Filing Protocol standard.	TOPS does not. So DataClub is compatible with more applications – especially multi-user databases.
Lower cost	Though it's much more capable, DataClub actually costs you less – one third the price of TOPS. And even less than that on larger networks.	Any way you look at it TOPS costs you more time and money.



The DataClub window opens just like any other disk – only it's shared and secure.

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San Jose Mercury News



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DOUG MILNER

Carol Zuber and James Black, two art directors responsible for integrating Macs at the *Dallas Morning News*.

The Art of War

CNN's broadcasts of the Desert Storm air raids on Baghdad gave television viewers a riveting view of modern warfare. But newspapers were hurting for a photographic equivalent.

Newspapers and wire services filled the void using off-the-shelf Mac technology. Television images became page-one photos. Macintosh illustrations offered readers everything from maps of the day's war action to full-page displays of an allied assault from the view of an Iraqi tank.

The key to covering the story graphically was the newspaper industry's acceptance of the Macintosh as its standard platform, says Ed Kohorst, news art director at the *Dallas Morning News*. "We can respond to breaking news halfway around the world . . . because of the Mac technology that everyone is using," Kohorst says.

When Scud missiles fell on a Tel Aviv neighborhood just before the newspaper's deadline, *Morning News* photo editors used a RadiusTV tuner and a Mac IIfx to grab a frame from CNN. They saved it as a PICT file, opened it in Adobe Photoshop, and converted it to Scitex format. Just 15 minutes later it was on the front page.

Where fighting or censorship blocked access to photos, graphics stepped in. Wire services such as the Associated Press and Knight-Ridder Tribune offered editors dozens of new graphics daily via phone and satellite networks. Most of the graphics were more than renderings of tanks. Based on reference manuals and Pentagon sources, artists explained such things as how Patriot missiles intercept Scud missiles.

Editors on smaller newspapers could download ready-to-run graphics in MacDraw II format. Larger papers frequently combined the drawings with their own work or drawings from other wire services, creating hybrid graphics that in turn were offered to other papers. An avalanche of electronic files filled newspapers' libraries.

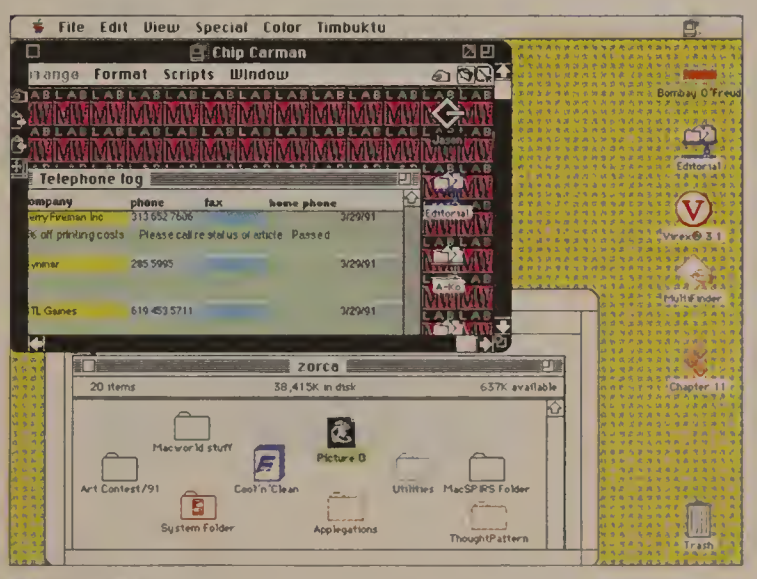
As Knight-Ridder Tribune's graphics director George Rorick joked just before the war ended, "If Saddam Hussein were bombed with all the infographics out there, the war would have been over long ago."—**Todd Copilevitz**

Two Ways to Be There

Ever want to stand over the shoulder of someone far away? Timbuktu and Carbon Copy Mac let you look across a network at a colleague's Mac. Timbuktu 4.0 shows you the other machine in color—or translates if you're watching on a monochrome machine. Carbon Copy Mac 2.0, while lacking color and Timbuktu's ability to visit several Macs at the same time, adds virus protection and some basic features missing from version 1.0, and it is a spectacular bargain.

Carbon Copy Mac 2.0 can have different passwords for different people, has a phone book, and can control a headless Mac. Carbon Copy's publisher, Microcom, says version 2.0 is also a lot faster. Unfortunately, Carbon Copy Mac can't talk to machines running the DOS version of Carbon Copy. A $99-per-person version works on a network and across telephone lines; a network-only version costs only $299 for a whole AppleTalk zone. Microcom is in Danbury, Connecticut, at 203/798-3800.

Timbuktu 4.0's password system has a simplified interface, and the program can now send and receive files in the background. It can copy from a remote machine to your Mac's Clipboard. It doesn't work across standard telephone lines. List price is $995 for 10 users or $1995 for 30 users. Timbuktu publisher Farallon is in Emeryville, California, at 415/596-9100.—**D.L.**



Multiple Macs: Timbuktu 4.0 can look across a network at several Macs and show them in color or black and white.

Reader Survey: Apple the Company

This month's survey reveals how *Macworld* readers feel about Apple's future since the introduction of the low-cost Macintoshes last fall. We also asked readers how they feel about the value of the machines themselves.

Overall faith in Apple as a company is extremely high. When we asked the question "How confident are you that Apple will be a strong, reliable company over the next five years?" 38.2 percent of responding readers said they were extremely confident. Another 40.6 percent said they were very confident, and 18.6 percent said they

(continues)



Generation X Color 24gx60



Control Systems ARTIST Mac10



Truevision NuVista® 1M, 2M, 4M



Micron Tech Xceed NB6-48



RasterOps® ColorBoard 224



RasterOps® ColorBoard 264



PCPC CGCII/32



Micron Tech Xceed SE/3010-78



Generation X VII



Truevision, HR 2M, 4M



Apple Macintosh II Video Card



PCPC CGCII/8

All majo

Not an unusual claim for a 4-star restaurant. But for a monitor, it's quite a story. With NEC's multiple-frequency technology, our monitors can accept all kinds of vidco cards for applications ranging from standard desktop software to large-screen graphics design. And your NEC dcaler has several diffcrent Macintosh-compatible MultiSync® monitors he'd be glad to show you. In fact, he might even take plastic.

MultiSync GS2A *Superior gray-scale monitor, 14" flat-surface screen. Supports the Macintosh II video card and compatibles. Ideal for desktop publishing.*



MacSync™ Series *Designed exclusively for Macintosh II video card and compatibles. Available in both non-glare and new high-contrast 14" screens*



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E Machines DoubleColor™



Micron Tech Xceed SE/306-48



RasterOps® ColorBoard 108 +



Relax Tech View II 8-bit 18"



Generation X V/30 X



Relax Tech View II 8-bit 19"



SuperMac ColorCard/24



RasterOps® ColorCard 232



Micron Tech Xceed NB10-78



Generation X V/30 A



SuperMac Spectrum/8 Series III



SuperMac Spectrum/24 Series III

cards accepted.

MultiSync 3D *Supports Macintosh II card and compatibles. Advanced microprocessor digital controls. 14" screen. Perfect for multimedia applications.*



MultiSync 4D *Resolution from standard Macintosh II card, 800 x 600, up to 1024 x 768. Choose your own dpi on a 16" screen. Microprocessor digital controls.*



MultiSync 5D *Resolution from Mac II card and compatibles up to 1280 x 1024 on a 20" screen for graphics design. Microprocessor digital controls.*



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RasterOps 8LC Display System and 24si Display Board

Ad produced on the Macintosh



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Our 24si board delivers 24-bit True Color with built on acceleration to the Macintosh IIsi.

For the Macintosh LC, the ClearVue/LC is an unbeatable monochrome system. The ClearVue/GSLC brings you the highest resolution gray scale. The 8LC display system puts 256 brilliant colors at your fingertips. And the affordable ClearVue/LC Monochrome and ClearVue/GSLC display boards bring high image clarity to the 15" Apple Portrait Display.



Our new 19" display systems bring 8-bit color, as well as monochrome and gray scale, to the Macintosh LC.

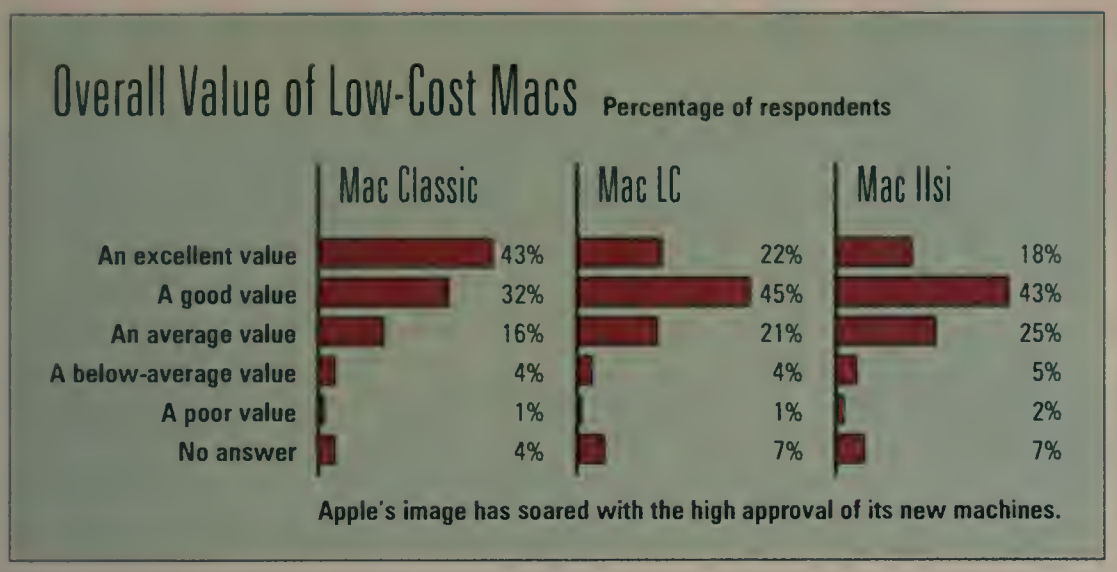
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Apple's image has soared with the high approval of its new machines.

were somewhat confident. Only 2.6 percent said they were not very confident, and 0 percent chose the response "not at all confident." When asked about Apple's greatest strength, 64.3 percent of responding readers cited the Mac interface and system software. As for Apple's greatest weakness, 42.9 percent said it remains the price of the company's products.

As for Apple's share of the personal computer market, 18.2 percent of readers expected it to grow rapidly compared to DOS, and 65.5 percent expected it to grow moderately. Another 13.8 percent predicted Apple's market share would remain the same, while only 2.1 percent said it would decline moderately, and no readers expected it to decline rapidly.

Readers who responded to the survey are very positive about Apple's products, with 38.5 percent saying they are extremely likely to buy products from Apple in the next 12 months. Another 25.9 percent said they are very likely to buy, and 20.3 percent said they are somewhat likely to buy from Apple in the next year. Meanwhile 11.2 percent said they are not very likely to purchase, and only 4 percent said they are not at all likely to buy from Apple in that period.—**T.M.**

Intelligent Indexing



How do social scientists, government officials, journalists, and others understand information—such as interviews, literature, and archival records—that has no numeric component and therefore doesn't lend itself to statistical reduction?

The provocatively named NUDIST (Non-numerical Unstructured Data-Indexing, Searching and Theorizing) is a tool for systematically analyzing such qualitative data and drawing abstract conclusions. It differs from other text-database-analysis systems like Verity's Topic (see *Macworld News,* "The Hot Topic," December 1990) in


ANDREW LEHMANN

Computer scientist Tom Richards and his sociologist wife Lyn Richards contributed their respective skills to NUDIST.

its breadth of search techniques and by requiring the researcher to incorporate his or her expertise in the indexing process.

Users first cull through their data (which can be online, on paper, or in any other format) and enter an index of terms and concepts (NUDIST can also autoindex online text against a word list). NUDIST can then search both index and online text with Boolean operators; word or phrase proximity and relationships; and other methods, including special query types based on tree-structured indexes, which can be any number of branches wide or levels deep. NUDIST has unlimited indexing capacity, saves queries in the index to refine the analysis, and lets users document their analysis by leaving notes in the database.

For example, a CIA officer might index all the newspapers in the Philippines to look for connections between labor union activity and communist insurgency. By putting moderate unions and radical unions on separate branches of the index tree, the officer might discern that extreme repression of moderate unions is always followed by increased insurgency, while repression of radical unions weakens insurgency.

Mainframe, VAX, and AppleShare versions are file-compatible and provide security for access to indexes and data files (NUDIST can also run as a stand-alone program). The Macintosh version still has a mainframelike interface that will be replaced in a free upgrade. Single-user licenses are A$250 (about U.S. $200); site licenses are A$3000; and a demo version is A$35. For more information, write Dr. Tom Richards, Applied Computing Research Institute, La Trobe University, Bundoora, Victoria, 3083, Australia, or call 011-61-3-479-2857.—**D.L.**

(continues)

VIRUS WATCH

Current viruses, Trojan horses, and worms affecting the Macintosh community.

HC

Type: Data virus
First listed in Virus Watch: 6/91
Info: Infects HyperCard stacks.
Impact: Causes the Mac to hum oddly. At press time *Macworld* did not know if HC is destructive.

nCAM

Type: Virus
First listed in Virus Watch: 5/91
Info: An nVIR clone.
Impact: Nondestructive; infects applications and system files; can cause crashes.

MDEF D

Type: Virus
First listed in Virus Watch: 5/91
Info: Infects applications and system files.
Impact: Nondestructive; can cause crashes.

Servers Demand DiskTwin.



CONTINUOUS BACKUP FOR APPLESHARE AND EMAIL SERVERS

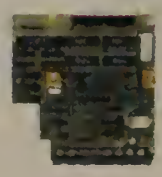
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Circle 99 on reader service card

Mac's Music of Catastrophe

When George Coates's multimedia production *The Architecture of Catastrophic Change* opened in an abandoned San Francisco cathedral, no one knew what to make of it—not even Coates. A Macintosh helped develop the odd mix of music that, in part, kept the show abuzz with controversy for months.

The Architecture of Catastrophic Change has a theme as jarring as its title. The loosely woven plot centers around a cheerful product-tester whose lack of prosthetic body parts makes him odd man out, a target of others' bloodlust in a world where people are mainly made of plastic, where PR jargon replaces thought, and where the dead sink while their stuffed suitcases rise to heaven.

As you enter the theater Coates's vision envelops you. Stage settings are gigantic, and 72 slide projectors hide the cathedral's cracked walls and domed ceiling with weird images such as a gargantuan cave of sugar crystals and a tangled freeway overpass.

Some of the music, which combines South African a cappella singing, Bulgarian folk tunes, and opera, is performed live on stage. It is interwoven with synthetic music that Marc Ream composed using a Mac II loaned by Apple, a dozen synthesizers, and software donated by Electronic Arts and Opcode Systems.

Ream only recently began composing on a computer. "I can get more detailed and complex using a Mac music program than I could with hardware sequencers," he says. Still, his favorite piece in the show is "Placebo," an a cappella piece for four singers.—**Mary Margaret Lewis**

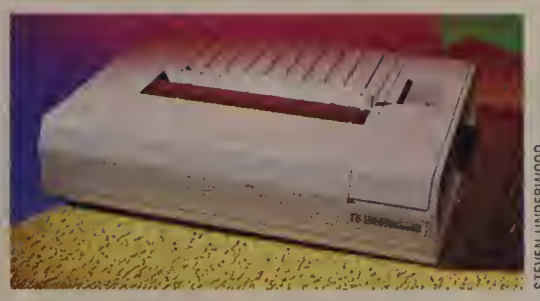


CHARLES ROSE

On stage at *The Architecture of Catastrophic Change*, where humans are dwarfed by set lighting.

HP PaintWriter Offers Color Matching

Hewlett-Packard has unveiled the HP PaintWriter, an integrated Macintosh version of its popular PaintJet color ink-jet printer. The PaintWriter includes a Chooser-level driver that lets the user choose Pantone color matching. The new 32-bit color QuickDraw printer also uses special inks that were designed to produce brighter colors.



STEVEN UNDERWOOD

The letter-size PaintWriter color ink-jet printer uses 32-bit QuickDraw.

The PaintWriter is three times as fast as HP's existing letter-size Mac solution, the HP PaintJet with the HP Color PrintKit (an upgrade for the PaintJet, which was designed for IBM PCs). The PaintWriter uses a high-speed RS-422C serial port, and produces a page of graphics on A-size paper in less than 4 minutes, and in less than 8 minutes on a transparency. The printer has a resolution of 180 dpi.

The HP PaintWriter is available now at a suggested list price of $1395. HP said it is offering a $200 rebate on the printer in the United States and Canada through May 31. HP is also providing a $235 upgrade to the HP PaintWriter for owners of the PaintJet with HP Color PrintKit, the previous Macintosh solution. The company also cut the price of its wide-carriage HP PaintWriter XL for the Macintosh from $2995 to $2595. For more information, contact HP at 800/752-0900. —**T.M.**

20-ppm Printer Works with Macs and PCs

QMS has introduced the QMS-PS 2000, a 20-pages-per-minute PostScript printer that can automatically sense whether an incoming file is in PostScript, HP PCL, HPGL, or optionally, other printer emulations. Designed for use over a network in environments that mix Macs and PCs, the printer comes with an RS-232C serial port, a parallel port, and an AppleTalk connector, all of which can be receiving files at the same time. QMS is also offering optional Ethernet, DecNet, and TCP/IP connections.

The QMS-PS 2000 comes with a Mac Chooser–level driver, a MIPS R3000-based RISC controller, 4MB of RAM, a floppy drive for font loading, and provision for optional 40MB or 120MB SCSI drives. The RAM can expand to 16MB. The printer includes Adobe Type Manager font-scaling software and 45 resident Adobe typefaces.

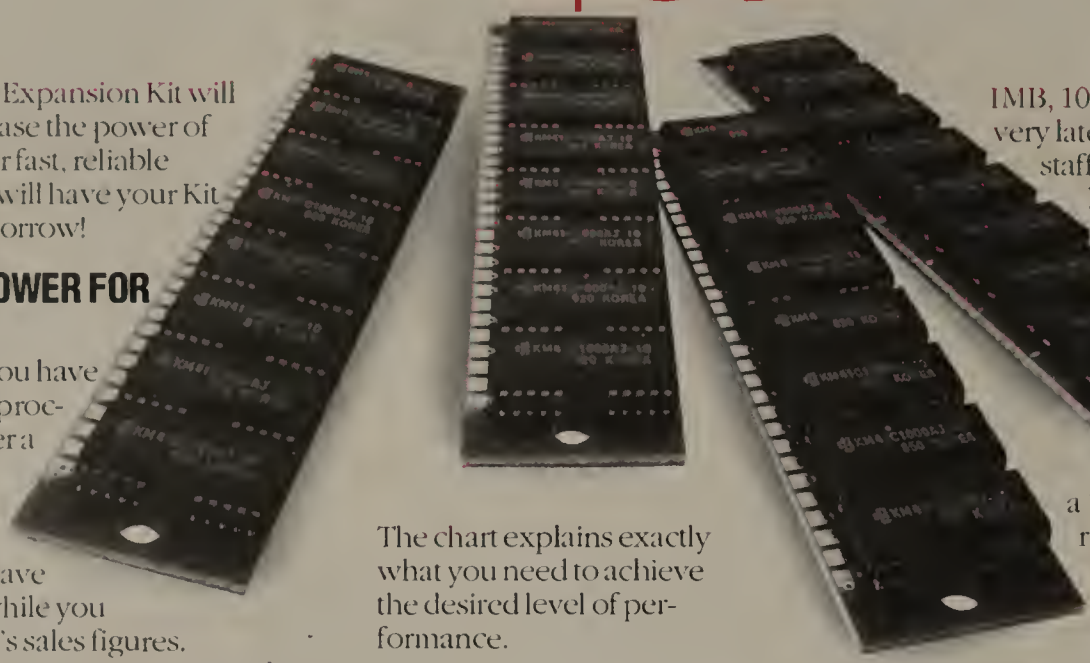
The printer can accept paper up to 11 inches by 17 inches. It includes two 250-sheet input cassettes, a 100-sheet output tray, and a 1500-sheet output stacker. The QMS-PS 2000 has a rated duty cycle of 70,000 pages per month. QMS expected to begin shipping the QMS-PS 2000 in May at a list price of $15,995. The optional duplexer and 1000-sheet feeder retails for $3495. For more information, contact QMS in Mobile, Alabama, at 205/633-4300 or 800/631-2692.— **T.M.**



The QMS-PS 2000 PostScript printer turns out 20 pages per minute and can receive files from Macs and PCs at the same time.

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Adding memory doesn't require technicians in lab coats. Just open your Mac, slide out the main circuit board and plug in your SIMMS. Our FREE video will give you STEP-BY-STEP installation instructions. Every type of Mac is covered and we think we've made it a breeze.



WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs - (2 @ $59 ea.).

The chart explains exactly what you need to achieve the desired level of performance.

To upgrade a 4-socket Mac Plus or SE to this amount ot memory.	Do this: (Install in multiples ot two only)
2 MB	Remove all four existing 256K SIMMs, install two 1 MB SIMMs, leave two sockets for future expansion.
2-1/2 MB	Remove only two 256K SIMMs, install two 1 MB SIMMs.
4 MB	Replace all four 256K SIMMs with four 1 MB SIMMs.
To upgrade an 8-socket Mac II, IIx, IIcx, oe SE 30 to this amount ot memory.	**Do this: (Install in multiples ot four only.)**
4 MB	Remove all four existing 256K SIMMs, install four 1 MB SIMMs, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMs, install four 1 MB in remaining sockets.
8 MB	Remove all four 256K SIMMs, install eight 1 MB SIMMs.

To open your Mac Plus or SE, you'll need a specially designed tool - it's available from us as part of a handy tool kit for just $9.

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Memory chips come factory-installed on plug-in cards, called SIMMS (Single Inline Memory Modules). Each one megabyte SIMMS card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products.
Prices can vary a lot, based on quality, speed and demand. At press time our price for 1MB, 100ns SIMMs is $59. Please call for the very latest prices and availability. Our sales staff will tell you what you need and help you make your choice an easy one.

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Microsoft Excel 3.0 offers many dramatic improvements in spreadsheet operations. You can place cells, graphs, and text anywhere, on the same page. Excel's Toolbar (with Autosum) automates common operations to save you time. The outliner expands spreadsheets to show detail, or contracts them to show broad structure. You can display your data with 68 different chart types, 24 in 3D. Excel also accesses remote databases through Apple's Data Access Language (DAL). Add support for System 7.0, plus goal-seeking and equation solving, and Excel will stimulate you to look for new problems to solve.
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- ACC0348 HardTops ImageWriter II Cover — 17.
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- ACC0351 Utility Pac — 15.

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- MED0040 Disks - Preformatted DS/HD (box of 10) — 25.
- MED0029 Disks - DS/DD (box of 10) — 12.

Curtis
- ACC0469 Command Center — 89.

Ergotron
- ACC0344 MacTilt II - 13" Color RGB — 75.
- ACC0128 MacTilt Plus/512 - Platinum — 68.
- ACC0009 MacTilt SE, SE/030 - Platinum — 68.

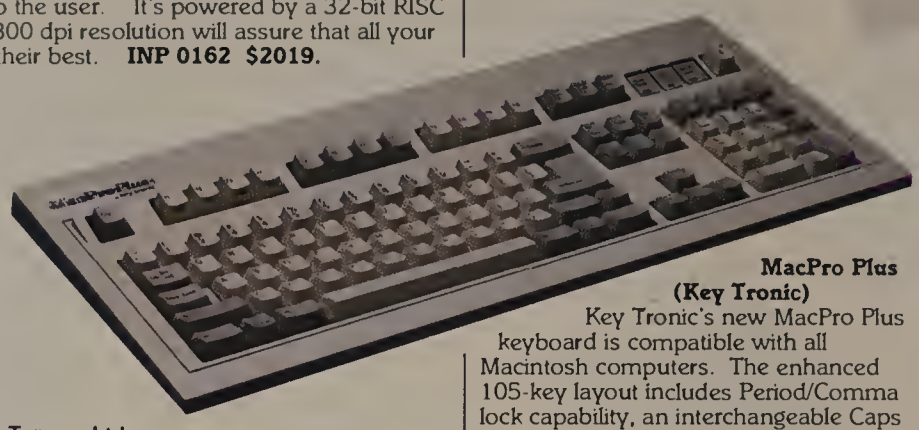
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- ACC0028 MacLuggage™ Plus Carrying Case — 64
- ACC1070 MacLuggage™ SE Carrying Case — 75.
- ACC0327 Monitorware Apple RGB Case — 79.
- ACC0427 Ultimate SE Carrying Case - Black — 79.
- ACC0440 Ultimate SE Carrying Case - Navy — 79
- ACC0529 Ultimate Classic Carrying Case - Black — 79
- ACC0528 Ultimate Classic Carrying Case - Navy — 79

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- ACC0097 System Saver Mac - Platinum — 63.

Mobius Products
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- ACC0247 SE Silencer — 39

PowerUser™
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Sony
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- ACC0482 Premier Leather Case — 185.

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Absolute Solutions, Inc.
- FIN0086 Computerized Classic Accounting — 225.

Checkfree Corporation
- FIN0088 CheckFree — 21.

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- FIN0044 ACC PAC Bedlord Simply Accounting 1.1 — 139.

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- FIN0013 Business Sense — 129.

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- FIN0043 Quicken 1.5 — 45.

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- BUS0132 WillMaker 4.0 — 37.

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- DAC0010 QuickDex — 3

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- BUS0135 Alarming Events — 8
- GRA0070 CalendarMaker 3.0 — 3

Claris
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- BUS0058 MacProject II 2.1 — 35
- BUS0065 SmartForm Designer — 28

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- BUS0099 DeltaGraph 1.5 — 12

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- BUS0064 WingZ 1.1 — 24

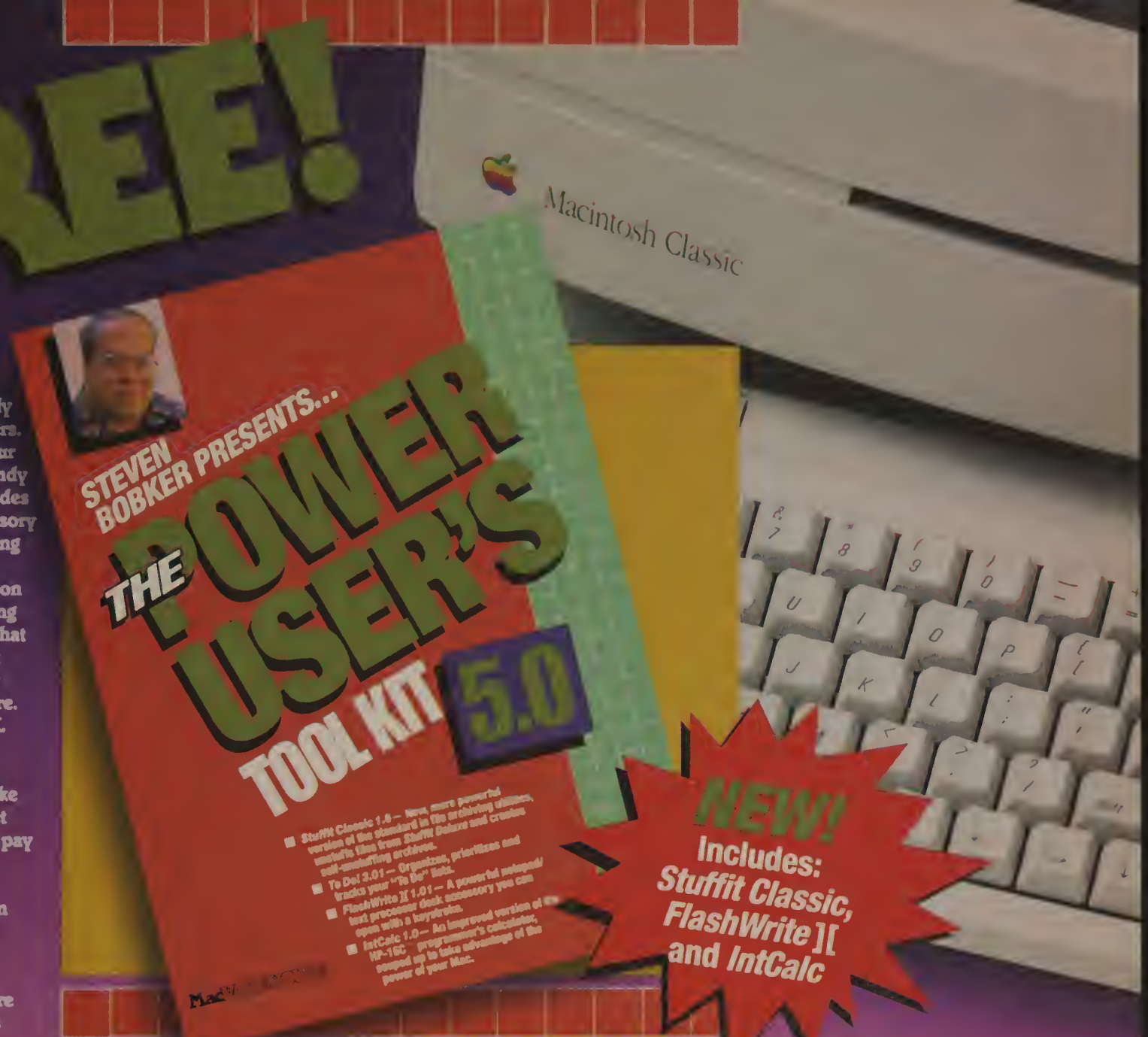


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BUS 0152 $215.

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NET0058 Timbuktu® 2.0 - Remote Access Pack 845.
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NET0034 Timbuktu Remote® 2.0 123.
PhoneNET® Card for EtherNet
NET0089 Nubus Mac II 359.
NET0091 SE/30 359
NET0090 Nubus 10-pack 3259
FreeSoft
COM0060 White Knight 1.1 85.
Hayes
COM0015 Smartcom II 3.2 84
Insignia
UTI0174 AccessPC 65.



UnMouse (Microtouch)
The UnMouse does everything a mouse can—only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface. To make a selection merely press down. The UnMouse also serves as an exteneded keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (60 in advanced mode). With its one million touch points the UnMouse also performs as a small graphics tablet. **INP 0084 $189.**

COM0063 Soft PC AT/EGA Module 125.
COM0045 SoftPC 1.3 245
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NET0097 DalaClub - 3 Pack 199.
NET0098 DalaClub - 10 Pack 539
Microcom
NET0041 Carbon Copy Mac - single 117
NET0088 Carbon Copy Mac - twin 189.
Prodigy
COM0056 Prodigy Starter Kit for the Mac 27
Sitka
NET0056 InBox Plus 3.0 1299.
NET0057 DOSTOPS 3.0 165.
NET0049 MACTOPS 3.0 187
Software Ventures
COM0043 Microphone II 3.0 215.
Technology Works
NET0117 GraceLAN 50-User 219.
Traveling Software
NET0045 Lap-Link III - Connectivity Pac 99.

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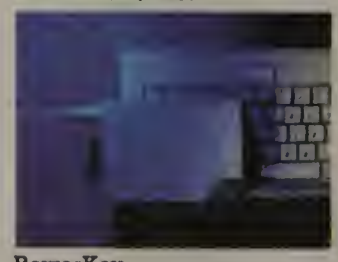
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White Knight V.11
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Streamlines your accounting, and delivers essential information on the status of your business. Create a sales invoice and MYOB adds the amount to Receivables, decrements the inventory, and generates the monthly customer statement. Integrating G/L, A/R, A/P, Inventory and card files. **FIN 0087 $145.**



PowerKey
Lets you turn on your Mac and up to three peripherals with the switch on the ADB keyboard. The Shut Down command turns the entire system off. Offers programmable power ups great for unattended backups. Turn on your Mac with a phone call for remote file access. Optional cable required. **ACC 0535 $65.**



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DiskDoubler 3.1
Compresses your files when saved and expands them when opened. Shrinks any file an average of 50%. It's like getting a new hard disk at a fraction of the cost. Version 3.1 retains icons of the original document, making Disk Doubler even easier to use. Works with documents, applications and more **UTI 0179 $45**



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UTI 0207 $51.



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MOD 0052 $699.



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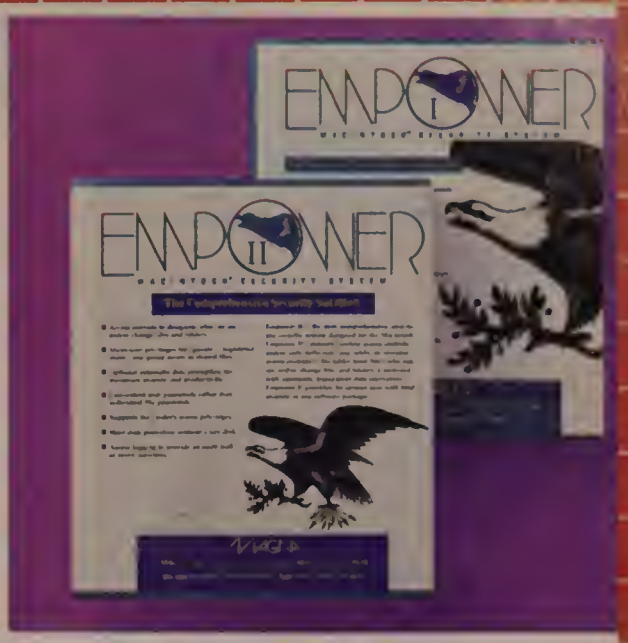
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Computer Friends
GRA0251 ColorSnap 32 Plus 649
Cutting Edge
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DRI0158 30+ meg Under the Mac Drive 339
DRI0162 45 Mb Removable Hard Drive (Syquest) 599
DRI0159 45+ meg Under the Mac Drive 389
DRI0160 60+ meg Under the Mac Drive 399
DRI0161 80+ meg Under the Mac Drive 469
Dayna Communications, Inc.
DRI0174 DaynaFile dual 360K (5.25) & 1.44 (3.5) 749
DRI0104 DaynaFile single 360K (5 1/4) 499
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DRI0186 800K Disk Drive - Fujitsu 99
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Empower I (Magna)
Provides password security for your Mac. Only registered users with the correct password can gain access to the data stored on floppy and hard disks. A screen saver hides displayed data from prying eyes. It can prohibit startup from floppies, and a log keeps track of all attempts to use your Mac. **UTI 0166 $89.**

Empower II
Offers three forms of security. First, it restricts access to authorized users at the system level. Then it restricts access to folders and files with options to view only, or make changes. You can specify access by individuals or by groups. Finally, it provides automatic, transparent DES encryption to protect sensitive data.
UTI 0146 $155.



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EDU0108 Desktop Help for Excel 52
HyperGlot Software Company
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Tense Tutor. French, German, Spanish or Italian ea 39
Verb Tutor w/ Sound: French, German, Spanish or Italian ea 39
Word Torture: French, German, Italian, Russian or Spanish ea 35
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EDU0245 RefBase 105
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EDU0048 Reader Rabbit 2.0 30
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EDU0190 Number Munchers 29
EDU0191 Word Munchers 29
MicroMaps
GRA0229 MapArt PICT Format 99
GRA0228 MapArt EPS Format 99
Nordic Software
EDU0142 MacKids Preschool Pack 36
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EDU0161 Computer SAT Prep 29
Visionary Software
EDU0207 LifeGuard 49
EDU0209 Synchronicity 49
Voice & Video
Getting Started Video: Excel 2.2, PageMaker 4.0, Word 4.0 ea 39
Advanced Techniques Video: Excel 2.2, PageMaker 4.0, Word 4.0 ea 39
EDU0063 HyperCard Getting Started Video 39
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BOK0021 MacBible - King James Version 59
BOK0020 MacBible - New International Version 59



Scan 300/Color (Abaton)
This 24-bit color and grayscale scanner provides the image scanning power of the future without sacrificing the standards of today. It is capable of scanning color, grayscale, halftone and line art images in resolutions ranging from 72 dpi to 300 dpi. Works in both Macintosh and IBM environments with most popular graphics and OCR packages. Comes with Interface Kit and Adobe Photoshop. **$1899. INP 0157**

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DRI0201 20 Meg External Hard Drive 329
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Beacon Technology, Inc.
HYP0034 HyperBible International Version 2.0 129
HYP0035 HyperBible King James Version 2.0 129
Broderbund
EDU0170 The Playroom 29
Davidson & Associates
EDU0037 Math Blaster 29
EDU0118 Math Blaster Mystery 29

ENTERTAINMENT

Artworx
ENT0303 Bridge 6.0 29
Baseline Publishing
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ENT0259 Shufflepuck Cafe 25
Where is Carmen Sandiego? ea 29
Bulls City Software
ENT0308 Moriarity's Revenge 35
Bullseye
ENT0045 Ferrari Grand Prix 1.6 31
ENT0046 Fokker Triplane Flight Simulator 2.8 25
ENT0261 P51 Mustang 2.80 35
Centron Software, Inc.
ENT0329 BlackJack Strategy Tester (w/ BlackJack Ace) 65
ENT0277 Casino Master 45
ENT0289 Casino Master Deluxe Mac II Version 49
ENT0257 CrapsMaster 27

Gemini and Mercury Accelerators (Total Systems)
Premium Gemini Accelerators will let your Mac SE outperform a IIci! Recommended by both MacUser and MacWorld (August 1990). The Plus Kit adapts the board to a Plus, 512KE, even an old 128KE. Optional math coprocessor speeds up math functions. The new value priced Mercury line provides System 7 without a dead end! Modular design allows the addition of expansion modules. Coupon included for FREE copy of VIRTUAL. Full line available.

Mercury/Plus: DRI 0295 $519.
Mercury/SE: DRI 0297 $389.
Gemini 20MHz: DRI 0301 $799.
Gemini 25MHz: DRI 0302 $999.
Plus Kit: DRI 0265 $129.



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UTI 0198 $105.

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Adobe Systems, Inc.
DTP0054 Illustrator 3.0 (w/ ATM 2.0) 389.
GRA0125 Streamline 2.0 129.
GRA0191 PhotoShop 579.
Aldus
GRA0264 Freehand 3.0 399.
Baseline Publishing
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GRA0239 Master Color 99.
GRA0238 Master Paint 51.
Innovative Data Design
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MacroMind
GRA0140 MacroMind Director 2.0 629
Metro Image Base (Full line available)
GRA0169 Newsletter Maker 85
Paracomp
GRA0235 FilmMaker 435
GRA0233 Swivel 3D Professional 435
GRA0234 SwivelArt 82
Praxitel
UTI0211 Read My Lips 75
Silicon Beach
GRA0092 Digital Darkroom 2.0 259
GRA0131 Super 3D 2.1 339
HYP0027 SuperCard 1.5 199
GRA0112 SuperPaint 2.0 135.
Solutions, Inc.
DAC0002 SmartScrap & The Clipper 2.01 56.
Strata
GRA0176 StrataVision 3D 349
Strategic Mapping, Inc.
GRA0227 Atlas MapMaker 4.5 369
Studiotronics
GRA0189 Colorset 1.5 179.
SuperMac
GRA0253 PixelPaint 2.1 149



Timeslips III 2.0 (TimeSlips Corp.)
The ultimate time tracking and billing software system invented for the Mac. New version 2.0 packs a time and expense program, a desk accessory stopwatch, generates hourly and flat fee charges , performs accounts receivable and contains invoice and report formats. Also has the capacity to handle big jobs: 250 users, 250 activities, 34,00 clients, 128 matters and a 32,000 character description field.
BUS 0043 $195.

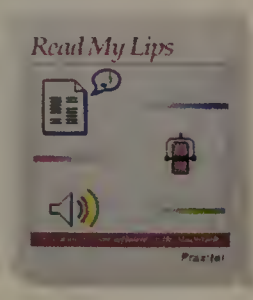
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Extend the Power of Timeslips with or without a general ledger accounting software with Timeslips III accounting link (TAL). Acquire the capability to link billing and payment data from Timeslips III to most general ledger and accounting programs. **FIN 0129 $55.**



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Lets you use the full power o Microsoft Word 4.0 by takin the mystery out of style sheets Displays and prints style set tings and samples in beautifull organized windows and reports Includes auto-formatting tem plates and dictionary of com puter terms. **WRD 0033 $51.**



VocabuLearn/ce 2.0
A dynamic, computer-en hanced foreign language learn ing system for the Mac. This versatile, interactive HyperCard stack is available in five lan guages and two levels. Includes two 90-minute audio cassettes plus a convenient word list with over 1500 useful words and expressions. **$35. ea.**



Read My Lips
Attach sounds to documents you create using popular word processors, desktop publishing, and presentation software. Use pre-recorded sounds or record your own. Both the built-in microphones of the new Macs as well as MacRecorder are supported. **UTI 0211 $75.**

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ENT0347 Wizardry II: Knight of Diamonds 29.
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ENT0269 The Hunt For Red October 20.
Three-Sixty
ENT0323 Sands of Fire 32.
XOR Corporation
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FON0264 Adobe Type Manager 2.0 59.
FON0351 Adobe Type On Call NEW! 47.
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FON0326 Adobe Type Set 3 129.
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DAC0028 TypeAlign 65.
FON0295 Adobe Type Reunion 45.
Altsys
FON0183 Art Importer 2.0 89.
FDN0014 Fontographer 3.2 269.
FON0284 Metamorphosis 2.0 89.
Broderbund
GRA0156 TypeStyler 119.
Dubl-Click
FON0081 MenuFonts 3.0 31.
Pacific Data Products
INP0153 Pacific MacPage 529.
Post Craft
DTP0062 Effects Specialist 115.
QMS
UTI0169 UltraScript 119.
Tactic Software
FON0265 ArtFonts 49.
TeleTypesetting
FON0343 T-Script 92.
FON0357 T-Script Basic 55.



Bright Star Tech, Inc.
GRA0161 interFACE 249.
Claris
CAD0029 ClarisCAD 2.0 645
GRA0118 MacDraw II 289.
GRA0117 MacPaint 2.0 90.
Creative Software
GRA0240 Easy Color Paint 2.0 47.
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GRA0075 Canvas 2.1 189.
GRA0187 UltraPaint 125.
Dream Maker
GRA0105 Cliptures Vol 1 Business Images 69.
GRA0124 Cliptures Vol 2 Business Images 69.
GRA0219 Cliptures Vol 3 Sports 69.
GRA0101 MacGallery (Hypercard version) 27.
GRA0102 MacGallery (MacPaint version) 27.
Electronic Arts
GRA0106 Studio/8 189.
GRA0231 Studio/32 449.
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GRA0249 PixelPaint Professional 2.0 465.
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GRA0209 ClickArt Business Cartoon 33.
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Uses virtual memory to open and scrool through large and multiple documents. Its new 8-bit masking tool permits semi-transparent masking from any brush, tool, or image. Image processing tools let you adjust color, contrast, and brightness. **GRA 0249 $465.**

Datadesk International

INP0097	DataDesk Switchboard	159.
INP0047	Mac 101 Keyboard SE/II	129

Digital Vision, Inc.

GRA0145	Computer Eyes B & W	199
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ICD

INP0095	Graflex	82



GraceLAN (Technology Works)
Scan and profile every Macintosh, printer, PC, monitor, NuBus Card, network peripheral or SCSI device on any size network without ever leaving your desk. GraceLAN allows you to identify system and memory configuaration, software versions, desk accessories, INIT's, printer drivers and much more. Sort, Filter, Export, Report, File, and perform a complete hardware/software inventory, without depending on mail or database programs. **50-User: NET 0117 $219.**



MacPrint 1.2
Easy-to-use software utility that lets you use most Mac applications with any HP LaserJet, DeskJet or compatible printer including the Series III. Prints text and graphics at the printer's maximum resolution, but does not support Postscript. Cable is included. **UTI 0098 $95.**

Zedcor

GRA0199	DeskPaint 3.3	115.

HARDWARE & PERIPHERALS

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INP0143	Typist	479.

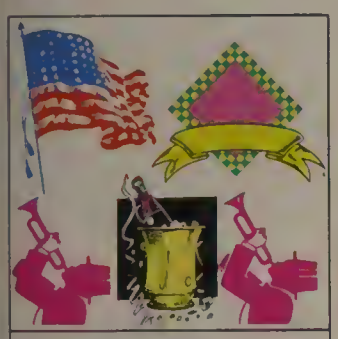
CoStar

INP0091	LabelWriter	185.

CasinoMaster (Plus/SE) & Deluxe Mac II Version (Centron Software)
Let it Ride! You can bet on having hours of fun with Casino Master's five exciting casino games. Includes **Blackjack, Ace, Crapsmaster, Roullette Master, Pokermaster and Baccarat Master.** Exact table simulation, mouse controlled betting, selectable bankroll, stored win/lose statistics and complete manual included in full color! An odds-on favorite with professional gamblers. Individual games **$27.** each./5 game Casino Master Package **ENT 0277 $45.** Deluxe Mac II version **ENT 0289 $49.**



New! Black Jack Strategy Tester
Includes **Free** copy of Black Jack Ace! Test your betting and playing strategies over thousands of hands. Card counting, 1-8 decks, 1-7 players. Go off to the casino with confidence! **ENT 0329 $65.**


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Communicate more effectively with fabulous art and graphics from the world's largest publisher of clip art. Each of the 18 ImageBase packages contains at least 100 topic-related images drawn by professional artists. (digitized at 300dpi or in EPS format). **GRA 0169 $85.**



TopDown 2.0
Lets you create great looking flowcharts, organization charts, process flows, documentation sheets and training materials quickly and easily Instantly write, draw and update your diagrams Hide or show details in a hierarchy of drawing levels. **BUS 0100 $219.**

Epson

INP0167	Epson EPL-7500 Laser Printer	2599
INP0168	Epson EPL-7000 Laser Printer	999.
INP0173	Epson PostScript Kit	1599.

MegaGraphics

MON0015	8-bit 19" Hi-Res Greyscale for Mac II	1895.
MON0016	8-bit 19" Hi-Res Greyscale for SE/030	1899.
MON0006	Rival System for Mac II	1199.
MON0008	Rival System for Mac SE	1199.
MON0007	Rival System for Mac SE/30	1199

Microtek

INP0162	TrueLaser Printer	2019

Seikosha

INP0041	Seikosha SP 2000 AP Printer	235.

Sharp

COMP007	Wizard OZ 7000 (32KRam)	229.
COMP018	Wizard OZ 7200 (64KRam)	255

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INP0007	ThunderScan Plus	199

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Curtis

INP0141	MVP Mouse	89

Kensington

NP0059	Turbo Mouse	109
INP0060	Turbo Mouse ADB (SE or II)	109.

Key Tronic

INP0156	MacPro Plus	145.

Koala

INP0127	MacVision 3.0	269.

Kraft

INP0094	Kraft ADB Trackball	79

Microspeed

NP0126	MacTRAC ADB	75
INP0140	MacTRAC DB9	62

MicroTouch

INP0084	The UnMouse	189.

Meeting Maker (ON Technology, Inc.)
A Macintosh network application that helps you plan,schedule and confirm meetings. You can schedule a time and date, select required guests, reserve rooms and resources and prepare agendas. Meeting Maker also has a personal calendar that allows you to block out activities, meetings, private work sessions, even recurring weekly or monthly appointments in a single step. You can also print your calendar in popular day-planner formats. **5-User BUS 0165 $325.; 10-User BUS 0166 $595.**

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INP0132	Little Mouse ADB	75
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Sophisticated Circuits

ACC0535	Power Key	65.

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DRI0197	MaraThon 030 - (MacPlus) w/Virtual	529
DRI0152	MaraThon 030X (MacIIx) w/ Virtual	529
DRI0151	MaraThon 030-SE/030 w/ Virtual	529

Micron Technology

DRI0321	PicturePress Card (Xceed ICDP-II)	745

MicroTech International, Inc.

CHP0025	Mac Classic 1 Meg Upgrade	79
CHP0026	Mac Classic 3 Meg Upgrade	179
DRI0315	Mac Classic Upgrade Kit 20-1	399
DRI0317	Mac Classic Upgrade Kit 40-1	499
DRI0318	Mac Classic Upgrade Kit 40-3	575

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CHP0013	1 Meg Simm 100ns PowerUser	59



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MOD0034 InterFax 24/90 ... 349.
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MOD0054 DataLink/Mac ... 209.
Dove
MOD0038 DoveFax Desktop ... 299.
Global Village
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MOD0050 MacModem V.32 / 9600 ... 689.
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MOD0047 PowerUser Mini Send Fax 2400/9600 ... 149.
MOD0062 PowerUser 24/96 Mini Send/Receive Fax Modem ... 199.
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MOD0046 ProModem 24/96 MSR ... 299.
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Shiva
NET0067 NetModem V.32 (9600) ... 1169.
Supra Corporation
MOD0020 SupraModem 2400 ... 119.

MUSIC & SOUND

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MUS0032 ALTECH MIDI Interface ... 59.
Coda Music Software
MUS0044 Finale ... 549.
Electronic Arts
MUS0004 Deluxe Music Construction 2.5 ... 85.
Farallon™ Computing
MUS0036 MacRecorder® 2.0 ... 159.
Opcode Systems
MUS0083 MIDI Translator ... 43

Praxitel
UTI0211 Read My Lips ... 75.
Tactic Software
Sound Clips Vol. 1, 2, 3 & 4 ... ea. 49.

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ASD Software, Inc.
UTI0135 FileGuard 2.5 ... 139.
UTI0130 FileGuard 2.5 - Office Pack 5 ... 349.
UTI0131 FileGuard 2.5 - Office Pack 10 ... 579.
ACC0539 MaccessCard Reader ... 299.



Fifth Generation System
UTI0120 DiskLock ... 118.
Kensington
ACC0235 Apple Security Kit ... 34.
PassProof ... 69.
Kent Marsh
UTI0028 MacSafe II ... 107.
UTI0064 NightWatch 1.03 ... 86.
Microcom
UTI0093 Virex ... 59.
UTI0150 Virex 10-pack ... 359.
Symantec Corporation
UTI0214 Symantec Antivirus for Mac 3.0 (SAM) ... 67.

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Affinity
UTI0198 Tempo II Plus ... 105.
Aladdin Systems
UTI0145 StuffIt Deluxe ... 63.
ALSoft
UTI0132 DiskExpress II 2.04 w/MultiDisk ... 57.
UTI0110 MasterJuggler 1.5 ... 57.

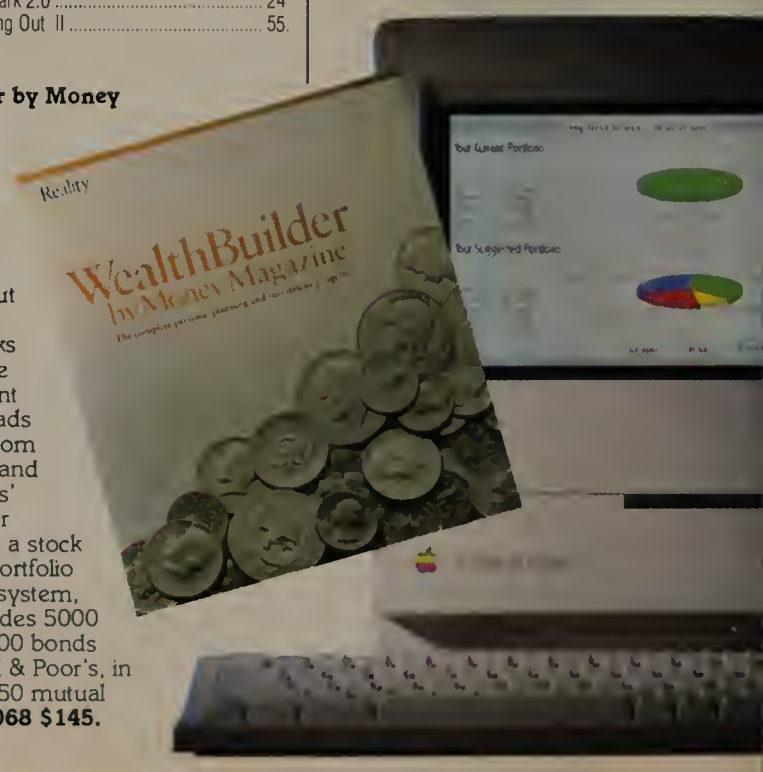
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UTI0187 INIT Manager ... 35.
UTI0190 Personality ... 49.
UTI0183 ScreenShot ... 31.
Berkeley System Design
UTI0119 After Dark 2.0 ... 24
UTI0074 Stepping Out II ... 55.

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CE Software
UTI0188 Quickeys 2 v.2 ... 97.
Connectix
UTI0148 HandOff II ... 57.
Custom Applications
UTI0136 Freedom of Press 3.0 ... 255
UTI0185 Freedom of Press Light 3.0 ... 55
Dantz Development
UTI0118 Retrospect 1.2 ... 148
UTI0196 Retrospect 1.2 Remote ... 275
Digitalk, Inc.
LNG0036 Smalltalk/V MAC ... 125.
Dubl-Click
UTI0194 ClickChange ... 41
Fifth Generation Systems
UTI0063 FastBack II 2.5 ... 125.
UTI0087 SuitCase II 1.2 ... 49.
UTI0035 SuperLaserSpool 2.02-Single User ... 93.
ICOM Simulations, Inc.
UTI0084 On Cue ... 35.
Insight Developement
UTI0098 MacPrint 1.2 ... 95.
Magic Software
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Magna
UTI0166 Empower I ..... 89.
UTI0146 Empower II ..... 155.
Mainstay
UTI0073 Capture 3 0 ..... 45.
UTI0189 MacFlow 3 5 ..... 175.
Microcom
UTI0191 Microcom 911 Utilities ..... 89.
Microsoft
LNG0030 QuickBASIC 64
Multi Ad Services
UTI0199 Multi Ad Search ..... 125.
Now Software
UTI0167 Now Utilities 2.0 ..... 79.
UTI0168 Screen Locker ..... 45.

Sensible Software
WRD0023 BookEnds 1.2 ..... 51.
SPL0018 Sensible Grammar ..... 51.
SNA, Inc.
WRD0033 Stylist ..... 51.
Tactic Software
WRD0030 Magic Typist ..... 49.
T/Maker Co.
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UTI0179 DiskDoubler 3.1 ..... 45.
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UTI0207 Offline ..... 51.
SuperMac
UTI0203 DiskFit 2.0 ..... 59.
Symantec Corporation
UTI0151 Norton Utilities for the Mac ..... 89.
UTI0078 Symantec Utilities for Mac II (SUM) 99
LNG0001 THINK's C 4 0 ..... 165.
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LNG0031 ZBasic 5.0 ..... 99.

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UTI0163 OmniSpell ..... 69.
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WRD0032 Taste 99
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by Robert C. Eckhardt

Solving Your SECURITY WORRIES

WHETHER THEY REALIZE IT OR NOT, all Macintosh owners have a security problem. In my case, when my hard drive started behaving erratically, I took it to a dealer for repair. As I drove home, it dawned on me that I had just given the repair department my financial records, my correspondence file, and all my software, including my bank-by-computer program. I might just as well have handed them the keys to my office and a box of blank checks. ◆ Of course, a hard drive repair isn't the only Macintosh security risk, or even the most likely one. Some people want to keep others from snooping through personal or confidential business files. Other people need to protect the Mac or its components from being stolen. Many others must protect data and applications from being infected with a virus. In one form or another, we all have a security problem. ◆ Practical solutions to security problems are a balancing act. Make access to the computer too difficult or complex, and even legitimate users will be deterred; solve a $50 security problem with a sophisticated $500 solution, and you've wasted a lot of money. To help you pick the most practical security system for your situation, I will describe many of the available security options and how they work. ◆ Although Apple has yet to list them as major clients, computer thieves, according to some police reports, have recently developed a preference for Macintoshes. To thwart burglars, you can tie your computer to a relatively immovable object, such as a table leg, using a cable kit from Kensington Microware, Doss Industries, Secure-It, or MacProducts. Or you can literally glue the Mac to a desk with Anchor Pad International's Anchor Pad, or Doss Industries' Padolock. Alternatively, S.T.O.P. (Security Tracking of Office Property) can tattoo Macs and peripherals with an indelible warning, a

ALLEVIATE COMPUTER SECURITY FEARS WITH HARDWARE, SOFTWARE, AND COMMON SENSE

DAN ESCOBAR



S.T.O.P. identification number, and the toll-free S.T.O.P. phone number that can be used to ascertain the legal owner. Since it makes resale so much more difficult, the tattoo is a significant deterrent.

As important as the loss of a computer is the theft of the data it contains. You could store all data on removable cartridges such as those from SyQuest or Iomega, and then lock the cartridges in a safe when you're not using them—but that's not very convenient for everyday use. Although it may add an element of risk (see "The Comfort Zone"), a much handier way to control access to data is to use a disk-locking program such as Fifth Generation Systems' DiskLock, ASD Software's FileGuard, Magna's Empower I and II, Kent Marsh's NightWatch, Verge Technologies' MacLock, or Casady & Greene's A.M.E. Each time you start or restart the Mac, these programs ask for the password assigned to the hard drive; only if you enter the correct password does the program unlock the drive and allow you to access its contents. Some programs such as DiskLock, NightWatch, and MacLock can unlock at once all the drives on a multidrive system that are protected with the same password. All of these programs also can relock the disk automatically at shutdown.

THE BEST, MOST COMPREHENSIVE ANTIVIRAL SYSTEM IS STILL A DEDICATED PROGRAM

Two programs—NightWatch and Advanced Gravis's Advanced Security—also require you to insert a floppy disk called a key disk. NightWatch's key disks are unique to each hard drive. Macs protected with Advanced Security, on the other hand, accept any disk containing any copy of the program. While this feature makes Advanced Security more convenient, it also makes the program less secure, since it offers a potential entry point for earnest intruders who happen to have a copy of the program. Even though you can make multiple copies of any key disk, many users dislike key-disk schemes, since key disks, like all disks, can wear out or become corrupted, and like real keys, can be lost or left at home.

More expensive but potentially more secure hardware schemes include Kent Marsh's GuardCard ($189.95), ASD's MaccessCard Reader ($349), and Kensington Microware's PassProof ($99.95). GuardCard, currently available for the Macintosh SE, SE/30, and IIsi, is an internal expansion board that prohibits any use of the computer without the proper password. PassProof includes hardware locks for a Mac's hard drive,

HARD DRIVE PROTECTION AND SCREEN-LOCKING PROGRAMS

Program / Company	Advanced Security / Advanced Gravis Computer Technology	A.M.E. / Casady & Greene	DiskLock / Fifth Generation Systems	Empower I and II / Magna	FileGuard / ASD Software	Hard Disk Deadbolt / FWB	MacLock / Verge Technologies	NightWatch / Kent
Version	1.2.2	1.1.6	2.01	4.0/3.1.1	2.5.2	1.0	1.5	1.03
Price	$69.95	$279	$189	$169 (I), $296 (II)	$249	$89.95	$75	$149.95
Online help	●	●	●	○	○	●	●	●
ACCESS CONTROL								
Prevents access to:								
Hard drives/hard drive partitions	●/●	●/○	●/○	●/●	●/●	○/○	●	●/○
Removable hard drives	●	●[3]	○	●	●	○	●	●
Uses a key disk	●	●[4]	○	○	○	○	○	●
Automatically locks on shutdown	●	●	●	●	●	○	●[4]	●
Allows multiple users or passwords	○	●	○	●	●	○	○	●
Can prevent insertion of floppy disks	●	●	○	●	●	○	○	○
Screen locking:								
On demand/after specified time	○/○	●/●	●/●	●/●	●/●	●/○	○/○	○/○
Screen-saver displays included	0	1	1	1	1	1	0	0
Allows background tasks	○	●	●	●	●	●	○	○
Virus protection included	●	●	●	●[5]	○	○	○	○
PASSWORDS								
Maximum length (in characters)	30	31	26	255	unlimited	32	225	200
Case sensitive	●	●	●	●	●	●	●	●[4]
Password override	○	●	●	●	●[4]	○	○	●
AUDIT TRAIL								
Creates audit log	●	●	●	●	●	○	●	●
Password required to open log	●	NA[7]	○	●	NA[7]	○	●	●[4]
Encrypts log	●	●	●	○	○	○	●	●
Allows user-defined entries	○	●	○	●	○	○	○	○
Log can be printed/exported	●/●	●/●	○/○	●/●	●/●	○/○	●/●	●/●

● = yes, ○ = no. [1] *$179.95 if you buy both NightWatch and QuickLock.* [2] *$129 if you buy both ScreenLocker and Now Utilities.* [3] *Does not include Bernoulli cartridges.*
[4] *This feature is optional.* [5] *Bundled with Disinfectant.* [6] *Bundled with Virus Detective.* [7] *Access privileges are defined by the system administrator.*

floppy drive, SCSI port, and case. For extra security, PassProof also includes a software application that requires a user to enter a valid password at start-up to unlock the system. Taking a different tack, the MaccessCard Reader allows users to sign in using a magnetic-strip card, alone or in combination with a password.

Foiled Again

To thwart would-be intruders, additional protective measures are built into many disk-locking programs. While some disk-locking programs permit the insertion of floppy disks (so that the computer—although not the hard drive—can still be used), others such as FileGuard, Empower I and II, and A.M.E. can automatically eject unauthorized disks (to prevent someone from using a snooper program or infecting the Mac with a virus). Some disk-locking programs, such as DiskLock, force you to turn the Mac off and then on again after three or four invalid passwords are entered. (This may be more irritating to an unskilled typist than to a wily intruder, however.) And should the power go out or an application crash, programs such as ultraSecure, from usrEZ Software, and DiskLock automatically relock the hard drive.

Some disk-locking programs can also prevent other people from using or destroying important files or applications. FileGuard, for example, can prevent accidental or malicious file deletion. To prevent others from using applications, FileGuard and ultraSecure can modify an application so that only password-holders can launch it. (Programs with internal virus protection, such as QuarkXPress, usually don't take kindly to this modification, however, because they interpret it as a viral infection.) FileGuard can also disable an application that's removed from a hard drive either by inserting a "suicide pill," which takes effect immediately, or by inserting a "time bomb," which disables the application after a specified number of launches or a specified period of use.

Preventing viral infections is another area where disk-access programs can help. With FileGuard, for example, you can set access privileges so that applications cannot be modified. With Kent Marsh's FolderBolt, you can prevent modifications to the files in the System Folder and the applications in one or more protected folders. Advanced Security can run a virus check each time you start up the Mac, but the check only tells you whether or not the Mac has been infected since the previous check; it doesn't prevent infections. The best, most comprehensive antiviral system is still a dedicated program like Symantec's SAM (my favorite), Microcom Software's Virex, or the shareware program Disinfectant.

Screen-Lock Lockout

Most disk-locking programs also allow you to lock the screen while you're away from the Mac; only if you provide the correct password can you unlock the screen and resume working. Other programs, such as Kent Marsh's QuickLock, Now Software's Screen Locker, and Fifth Generation Systems' popular screen saver, Pyro,

	QuickLock / Kent Marsh	Screen Locker / Now Software	SecureInit / Direct Software	ultraSecure / usrEZ Software
	2.0	2.0.2	2.3	1.1
	$59.95 [1]	$79 [2]	$99.95	$290
	●			●
		●	●	●/●
		●	●	●
		●	●	●
				●
	●		●	●
	●●	●●	●●	●/●
	2	6	1	1
	●	●		
			● [6]	●
	[5]	256	8	31
	●		●	● [4]
	●			●
		●		●
		● [4]		● [4]
				●
				●/●

THE COMFORT ZONE

All but the simplest disk-locking programs use a digital version of smoke and mirrors to foil unauthorized entry. Programs such as FileGuard and Empower I and II fiddle with the driver software. NightWatch and FolderBolt manipulate the disk's file-locating catalog. A.M.E. outdoes them all (in its default mode) by scrambling the entire disk. Only if the correct password is entered will these programs blow away the smoke, reconstruct the driver or disk catalog, and pass the necessary information to the Mac.

In another sense these security tricks are like sawing a woman in half. If the trick works, great; if it fails, the results can be disastrous. With some disk-locking programs, if the program is installed when you perform common drive-maintenance tasks, such as updating the driver or system software or optimizing the hard drive, the disk may be corrupted. File-recovery utilities can usually restore unencrypted files on the corrupted disk; in A.M.E., however, the fact that everything on the disk is scrambled makes file recovery virtually impossible.

Another danger point is installation. When I installed one disk-locking program, for example, something went very wrong. I couldn't unlock the disk, nor could I recover my files by using 911 Utilities, Norton Disk Doctor, or ResEdit, among others. Similarly, a power failure during the A.M.E. installation routine (which can take quite a long time for a large-capacity hard drive) can wipe out all the files on the disk.

The moral is simple. If a program makes you uncomfortable because of its added risk element—and A.M.E., for reasons you've seen, makes many users uncomfortable—use a different program. And comfortable or not, *always* back up your data before installing a disk-locking program; back up religiously thereafter.

offer screen locking only. These, and such simple security programs as SecureInit, can be easily outsmarted by restarting the Mac from a floppy disk—a trick that any intelligent Macintosh user will hit upon quickly. If you want to deter intruders who are more persistent than the casual passerby, make sure that the screen locker either is part of a disk-locking program or works in conjunction with a disk locker (the way QuickLock works with NightWatch, for example), to eliminate such elementary back doors.

KEY DISKS, LIKE ALL DISKS, CAN WEAR OUT, AND LIKE REAL KEYS, CAN BE LOST

The better screen lockers can lock on demand (say, when you press a key) or after a preset period of inactivity. Some screen lockers permit background tasks, such as printing or modem transmissions, even when the screen is locked (although, for sophisticated intruders, this may open up a back door to the Mac's hard drive). Few display anything interesting when the screen is locked. QuickLock offers the widest choice of screen displays (see "Pick Your Poison"), but if you want both colorful screen displays and relatively secure screen locking, DiskLock's ability to work hand in glove with Pyro is the best bet.

Prying Eyes

Preventing anyone else from using your computer is not always possible, or even desirable. If you don't want to lock an entire hard drive, you can divide it into several partitions, and then password-protect only those partitions containing sensitive information. Although some disk-locking programs, such as DiskLock and Now Software's Screen Locker, can lock only an entire hard drive, others, such as Advanced Gravis's Advanced Security, can lock partitions. In addition, many drive-partitioning utilities—such as Symantec's Partition utility (part of SUM II), FWB's Hard Disk Partition, ALSoft's MultiDisk, and most of the proprietary partition utilities with hard drives—can password-protect the partitions they create. But unless a partition is also encrypted (an option in all three of these partitioning programs), anyone with access to the main partition and a disk-editing program such as Norton Disk Editor can read the contents of the other partitions with relative ease.

Network users and administrators have many more options available to them for fine-tuning access privileges. On AppleShare networks, for example, the administrator can divide the system into a number of zones and deny or permit individual users access to zones. Each user can also designate his or her individual files or folders as private, available to selected users, or open to everyone with access to the zone. Empower II, FileGuard, and ultraSecure offer AppleShare-style access privileges—using an interface more or less identical to AppleShare's. A.M.E. provides a similar set of privileges, but because the program's interface is quite unlike AppleShare's, some users find it unfriendly and inconvenient.

FILE AND FOLDER PROTECTION PROGRAMS

Program / Company	Advanced Security / Advanced Gravis Computer Technology	A.M.E. / Casady & Greene	Camouflage / usrEZ Software	DiskLock / Fifth Generation Systems	Empower I / Magna	Empower II / Magna	FileGuard / ASD Software	FolderBolt / Ke
Version	1.2.2	1.1.6	1.4	2.01	4.00	3.1.1	2.5.2	1.01
Price	$69.95	$279	$169	$189	$169	$296	$249	$129 9
Separate application or cdev	●	○	●	●	●	○		
FILE AND FOLDER ACCESS PROTECTION								
Protects files from: [1]	D, R	C, D, M, R	○	D	○	D, M, R	D, M, R	C, D, M
Protects folders from: [1]	○	C, D, M, R	○	D	○	D, M, R	D, M, R	C, D, M
Protects applications from: [1]	D, R	C, D, M	○	D	○	D, R	C, D, R	C, D, M
Password-only protection	●	●	○	●	○	●	● [3]	●
ENCRYPTION								
Can encrypt select files/all files in a folder	○/●	●/●	●/●	●/●	○/●	○/●	○/●	○ [5]
Can encrypt files in subfolders	●	●	● [4]	●	○	●	○	○ [5]
Can encrypt applications	●	●	●	●	○	○	○	○ [5]
Supports batch processing	●	●	●	○	○	○	○	●
Auto-encrypt/decrypt on save/open	○	●	○	○	○	●	●	○
Auto-reencrypt on closing or shutdown	●	●	○	●	○	●	●	●
Supports DES encryption	●	●	●	●	●	●	○	○
Compresses files	○	○	○	○	○	○	○	○
Erases or writes over original file	●	●	● [4]	●	●	●	●	○
Can create self-decrypting files	●	○	●	○	○	○	○	○
PASSWORDS								
Maximum length (in characters)	30	31	16,384	31	255	255	u d	255
Password override	● [4]	●	○	●	○	●	●	●

● = yes; ○ = no. [1] C = copying; D = deleting; M = modifying; R = reading. [2] System files/Folders only. [3] For applications only. [4] This feature is optional. [5] FolderBolt does not encrypt files, but it offers similar protection with passwords. The Encrypit option ($39.95) lets you encrypt selected files or files in folders.

FolderBolt, on the other hand, is as friendly and convenient as can be. FolderBolt controls file access by designating folders as unlocked (accessible to all), read-only (applications can be run and files opened, but none can be copied, deleted, or modified), drop-in (anyone can put a file in the folder, but only password-holders can open the folder), or password-protected (only password-holders can use the folder). Opening a locked folder is as simple as double-clicking on it and entering the correct password; to lock a folder, you need only shift-click on a window's close box and specify the desired password. No matter which of these programs you use, however, keep in mind that they all add a layer of housekeeping: someone must act as a system administrator and attend to all the details (see "Privileges: Getting and Setting").

Coded Messages

If you prefer to control access only to individual files, or if you want to add another layer of protection on top of access controls, you can encrypt sensitive files. Some file-encryption programs, such as DiskLock, usrEZ's Camouflage, Empower I, and SuperMac's Sentinel, are separate applications or cdevs that require you to leave an application to decrypt a file. Depending on the program, you can encrypt individual files, all the files in a folder, or a user-defined list of files. Some programs such as DiskLock can be set to automatically reencrypt any files left open at shutdown.

Stand-alone encryption programs are satisfactory if you protect only a small number of often-used files. But for day-in, day-out work with large numbers of files that must be protected, programs such as Empower II, FileGuard, and ultraSecure, which integrate with the Open and Save dialog boxes of applications, are far more convenient. These programs automatically ask for the password, and encrypt, decrypt, and reencrypt protected files as you save, reopen, and close the files; you never need to leave your application, and you never need to worry that a file is accidentally left unprotected.

Virtually all file-encryption programs (U.S. versions only) offer DES encryption, a Defense Department–approved encryption scheme that (this week, anyway) can be broken only by a few supercomputer-equipped super sleuths such as the National Security Agency. But because DES encryption can be rather time-consuming, encryption programs normally offer at least one speedier scheme as well. Keep in mind, however, that you get what you wait for. Generally speaking, the longer an encryption scheme takes to encrypt a file, the longer it will take someone to break the code.



PAUL FRANZE MOORE

Several companies offer cable kits that attach your Mac to an immovable object. The MaccessCard Reader lets users sign onto a Mac using a card with a magnetic strip such as an ID card, a credit card, or MaccessCard's own cards.

Ft.Knox / Transfinite Systems Company	Hard Disk Deadbolt / FWB	MacSafe II / Kent Marsh	MacTools Deluxe (Secure) / Central Point Software	Personal FileLock / Verge Technologies	SecureInit / Direct Software	Sentinel / SuperMac Technology	Stuffit Deluxe / Aladdin Systems	SUM II (Encrypt) / Symantec Corporation	ultraSecure / usrEZ Software
1.0.5	1.0	2.0	1.1	1.0.1	2.3	2.2	2.0.1	2.0	1.1
$195	$89.95	$189.95	$129	$39.95	$99.95	$149.95	$99.95	$149.95	$290
●	●	●	●	●	●	●	●	●	
	○	C, D, R	D, R	○	M [2]	R	○	○	C, D, M, R
	○	○	D, R	○	R [2]	○	○	○	C, D, M, R
	○	C, D, R	D, R	○	D, M	R	○	○	C, D, R
	● [3]	●	●	○	○	○	○	○	● [3]
○/○	●/●	●/●	●/●	○/●	○/○	○/●	●/●	●/●	●/●
○	●	○	●	●	○	● [4]	●	●	●
○	●	●	●	●	○	●	●	○	●
○	●	●	○	○	○	●	●	○	○
○	○	○	○	○	○	○	○	○	●
○	○	○	○	○	○	●	○	○	●
●	●	●	●	○	○	●	●	●	●
○	○	○	● [4]	○	○	○	●	○	○
● [4]	●	●	● [4]	●	○	●	● [4]	●	● [4]
○	○	○	○	○	○	○	○	○	○
31	32	200	32	255	○	20	255	15	31
○	○	● [4]	● [4]	○	○	○	○	○	●

Encryption, and DES encryption in particular, is the most effective way to keep sensitive, on-disk information under wraps. As with disk locking, however, file encryption adds an element of risk. If the hard drive crashes, for example, data in encrypted files will most likely be lost, since file-recovery programs rarely succeed in restoring encrypted files. As usual, the best protection against data loss is to back up regularly; whenever possible, keep a backup of the unencrypted file (in a secure location, of course).

THE LONGER IT TAKES TO ENCRYPT A FILE, THE LONGER IT TAKES TO BREAK THE CODE

Secure Communications

Encrypted files can be sent (via a floppy disk or a telecommunications program) to a colleague, with little worry that someone else will be able to read them. In most instances, however, since the recipient must also have a copy of the security program in order to decrypt the file, the list of potential recipients is limited. Advanced Security and ultraSecure solve this by gluing a decryption engine to the encrypted document. The recipient need only double-click on the document and enter the password; the built-in decryption engine then restores the file and self-destructs.

Of course, you need to give the recipient both the encrypted file and its proper password. If you use a program like Camouflage or DiskLock, you can use a different password for each recipient (or each file). Some programs, such as Advanced Security and Verge Technologies' Personal FileLock, allow you to use a one-time "sign-in" password for all the files they encrypt and decrypt. Although this can save you time, it means that anyone who knows the password to one transmitted file knows the password for all your files. Password sign-in has other drawbacks as well: should you leave the computer unprotected after signing in, anyone can open any file without knowing the password; and if you change your sign-in password, previously encrypted files no longer open automatically.

In some situations, concealing the contents of a file is not as important as knowing that the file has not been tampered with. For example, if you transmit purchase orders over a network, the purchasing agent needs to know that the supervisor's "signature" is valid and that the order has not been altered since it was signed. Aladdin Systems' StuffIt Deluxe can date and attach real, hand-drawn signatures to its archive files and notify you of alterations to the file, but the process is not very sophisticated, convenient, or secure. RSA Data Security's RSASign and RSACheck were still in beta testing at press time, but they appear to offer a far more sophisticated and quite secure alternative.

As more and more Macs are connected to networks, the security of modem connections becomes ever more important. Generally, there are two ways to screen telephone callers attempting to log on to a network. One scheme, password entry, works much like disk locking and file encryption: dial up, enter the correct password, and you're connected. Such systems can be software-only (Farallon Computing's PhoneNet Liaison), hardware-only (LeeMah DataCom Security's TraqNet 2001), or combinations of hardware and software (Shiva's NetModem).

The other scheme, call-back, is more secure but a bit more complex. The host system keeps a database of authorized callers' names and phone

PASSING THE SECURITY TEST

For a disk-locking program to be effective, all potential backdoor entries must be sealed shut. Unfortunately, the factory settings in some programs leave one or more back doors wide open. (For example, Advanced Security's option for automatically locking the disk during shutdown is turned off when you first use the program.) To ensure that a program's back doors are shut tight, and to check for other security lapses, try these simple tests after installing the program.

1. Shut down in the usual way (with the Shut Down command) and then restart the computer.

2. Restart by pressing the restart button on the side of the Mac (if it has one). *Make sure all documents are saved and closed before you do this.*

If you are greeted by an unlocked disk after either of these tests, you need to turn on the automatic-locking options of the disk-locking program you're using.

3. Restart the computer using a floppy disk as the start-up disk.

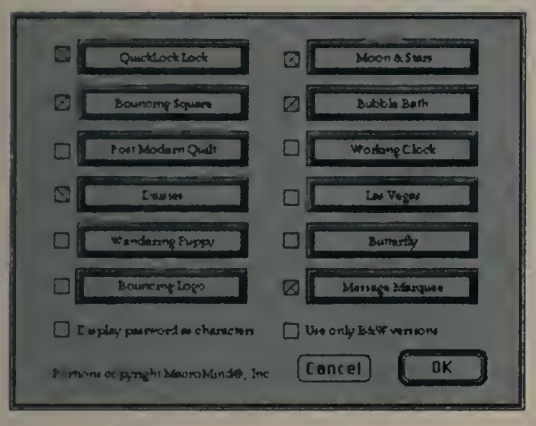
If an unlocked disk appears after test 3, turn on the option that prohibits the use of floppy start-up disks—if the program has one. If the program does not have that option, and if you need more than a very mild deterrence, you should use a different program.

4. Copy a System Folder and your hard drive's installer program onto a floppy disk. Restart the computer using the floppy disk. Press option-⌘-shift-delete during the start-up process (this prevents the Mac from attempting to mount the hard drive). Now launch the installer program and try to remount the hard drive using the installer's Mount command.

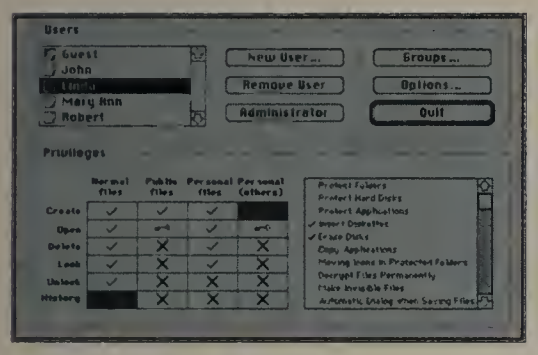
5. Copy a System Folder and an application onto a floppy disk. With the Set Startup command, turn off MultiFinder and set the application to open automatically at start-up. Restart the computer using the floppy disk. In the now open application, select the Open command and attempt to locate the hard drive by clicking on the Drive button.

If an unlocked disk appears in tests 4 or 5, and that worries you, use a more sophisticated program.

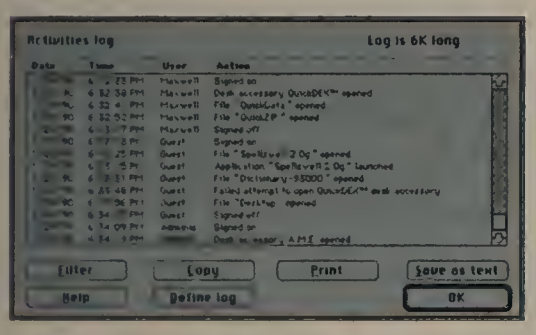
numbers. The caller dials in, enters his or her name and password, and then the communications software hangs up. The host system looks up the phone number corresponding to the caller and calls back to make the connection. In this way, only a password-holder at the correct phone number can gain access to the system. Call-back is available with PhoneNet Liaison and TraqNet 2001.



Pick Your Poison When it locks your screen, QuickLock displays the color screen-saver animation that you select; if more than one animation is selected, QuickLock displays a different one each time. Clicking on the name of an animation in the list opens a small preview of it.



Privileges: Getting and Setting For each user of a Mac, FileGuard combines an AppleShare-style privileges matrix with a list of activities that the system manager can permit or prohibit.



Logged On Almost all security programs create audit trails that alert you to failed attempts to enter the system or open encrypted files, but only A.M.E.'s log can be customized extensively. It can track all uses of all classified documents for each user of the system, for example, or simply tell you which applications are used most often and which ones not at all.

High Anxiety

Even if you're not a George Smiley type who assumes every phone is tapped, the fact that deleted files aren't actually deleted is something all security-conscious Macintosh users should be aware of. On the Mac and many other personal computers, a deleted file is struck from the disk's file directory, but its data isn't erased until another file is written over it. Meanwhile, anyone with a file-recovery program can reconstruct some or all of the file's contents. To prevent snooping of this sort, the Department of Defense's *Industrial Security Manual* requires that erased files be overwritten with meaningless data a number of times. (Just as erased audiotapes can sometimes be partially restored, files written over just once can sometimes be recovered with special equipment.)

A.M.E. can automatically overwrite deleted documents seven times, thus converting the Mac's Empty Trash command into the digital equivalent of a paper shredder. Since deleting a file is then akin to writing to disk (seven times), file deletion takes much longer when this option is active. Transfinite Systems Company's Ft.Knox can also overwrite files, but you must manually instruct it to do so from within the program. It can overwrite single files or the contents of entire drives; it can also clean files to make sure that any sensitive data that has been cut from the document isn't still hidden away somewhere.

In addition, you can use Ft.Knox to empty the Mac's PRAM and the LaserWriter's ZPRAM (two portions of RAM that don't lose their contents when you turn off the machine). A truly sophisticated intruder could otherwise install a program on your hard drive that secretly stores your passwords in PRAM or ZPRAM. Later, the intruder could retrieve the passwords and break into your system.

Caveat Emptor

Computer security—or the lack thereof—is in the eye of the beholder. One person's security system may be as holey as Swiss cheese to someone with more rigorous standards. Overall, however, I am especially impressed with the unobtrusive way FileGuard, Empower II, and ultraSecure work almost entirely in the background. I also like DiskLock's relatively simple but effective answers to both file and hard drive security, FolderBolt's simplicity, and Camouflage's self-decrypting file option. Sentinel and FileGuard have well-designed manuals; NightWatch, DiskLock, and Advanced Security are burdened with decidedly inferior ones. A.M.E.'s attempt to be all things to all people makes it too confusing, too complex, and—when it scrambles the entire drive—too risky. SecureInit is the germ of a good idea, but it needs a lot of work.

No matter which program you use, be aware that someone can overcome virtually any security system, given enough effort, intellect, and time. Some schemes can be broken with nothing more than a floppy start-up disk; breaking others requires considerable expertise and expensive, sophisticated tools. But all schemes can be outsmarted, sooner or later. Ultimately, if absolute computer security is what you're looking for, you may need to resort to a decidedly old-fashioned method: storing sensitive information in a safe, not in a computer. ◘



PAUL FRANZE MOORE

Doss Industries' Padolock has peel-off adhesive on top and bottom. You place the Padolock between a Mac and a desk. After the adhesive cures, even Rambo would have a hard time prying the Mac off. (You can unstick the Padolock using a special technique; you must then send the Padolock back to Doss for a new glue layer.)

See *Where to Buy* for contact information.

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15

flatbed

scanners

under

$15,000



From top to bottom: Howtek Scanmaster 3, XRS OmniMedia 3c, La Cie Silverscanner

Affordable Color

Jack of all trades, master of none: the idea that flexibility exacts a price in excellence is a common one. It's also an idea that perfectly describes color flatbed scanners, the closest thing to a universal art-input device. A flatbed scanner can digitize anything from marble to muslin. Need source materials for a collage, slide show, or multimedia presentation? A flatbed brings the entire two-dimensional world—from book and magazine illustrations, to oil paintings, to pressed flowers if you like—within your grasp. The average flatbed doesn't give photo publishers the detail and color saturation possible with good transparency scanners, but it gets close enough for many purposes. And it does its job, in many cases, whether the source is a 35-millimeter slide, a 4-by-5-inch transparency, or a color print.

In the nine months since *Macworld* last looked at color scanners ("Color Scanners: Pick from a Growing Field," August 1990), the number of flatbeds has more than tripled, making this the fastest-growing segment of the scanner market. Today color flatbeds range in price from $2000 to $70,000. For this article, however, I evaluated low- to medium-price units, from $1995 to $14,995. In this price range, your choices are determined by the resolution you need for the work you do, the kind of artwork you plan to scan, the size of the images you want to capture, and the sophistication of the software that you require.

What makes a good color scanner, and how do you pick one? Scanner manufacturers all tout different design features that supposedly give their units an edge. The fact is, however, that a good scanner—a complex balance of carefully crafted parts—is only as strong as its weakest link. The way to evaluate scanners is to keep your eye on the most critical point, their performance in capturing and reproducing images. By subjecting 14 flatbed scanners to a series of objective tests that evaluate their speed, resolving power, registration, color balance, and color saturation, as well as subjectively evaluating the separations they produced, I concluded that when it comes to flatbed scanners in this price range, spending more money doesn't necessarily buy enhanced image quality. The scanners at the low end of the market offer more-than-adequate image quality at very competitive prices.

The Hard(ware) Choices

If higher prices don't buy better image quality, what do they buy? Among the scanners I looked at, three factors tend to control pricing: the size of the scanning area, the maximum scanning resolution offered, and the ability to scan slides and transparencies as well as reflective art such as books or photographs. Simply put, the more money you spend, the more flexibility you buy.

Your first choice is perhaps the most clear-cut. If you regularly scan large art you need the large, 11 by 17, scanning area offered by the Sharp Electronics JX-450, the Howtek Scanmaster 3, the Mitsubishi SC-7500, and the Sharp Electronics JX-600 scanners. You pay an additional $1495 for this added flexibility, though, and you need a lot of desk space to accommodate your new image collector.

Resolving the Issue

How much resolution you need for your work depends almost entirely on how you plan to reproduce the scans. Optical resolution, the maximum number of dots per inch that the scanner's hardware can distinguish, is the critical measurement to keep in mind. Higher-resolution scanners can capture more data from an image, but you pay for that added detail. There is a $1000 tariff to move from the most-expensive 300-dpi unit reviewed, the Sharp Electronics JX-450, to the least-expensive 400-dpi scanner, the Howtek Scanmaster 3. To move from the Mitsubishi SC-7500, $8950, the most-expensive 400-dpi unit, to the Imapro QCS-120's 600-dpi resolution (least-expensive 600-dpi unit) costs an extra $3040.

As it happens, though, the 300-dpi resolution offered by the 10 least-expensive scanners evaluated here is more than enough for images that will be printed on low-resolution devices like LaserWriters or color printers, printed as even 150-line halftones (as long as you don't enlarge the original), or displayed on computer or video screens. Higher resolutions are really required only to scan in very precise line art such as CAD illustrations and architectural drawings, to enlarge a scan's output dimensions.

In all of these applications, higher-resolution scans provide the computer with more raw information, transforming the jaggy line art in a 300-dpi scan to smooth curves, and allowing you to enlarge an image without significant degradation. For the best possible output you need to maintain between a 1.25:1 and a 2:1 relationship between the input resolution (measured in dpi) and the output resolution (measured in halftone

by
Joe Matazzoni

Scanning

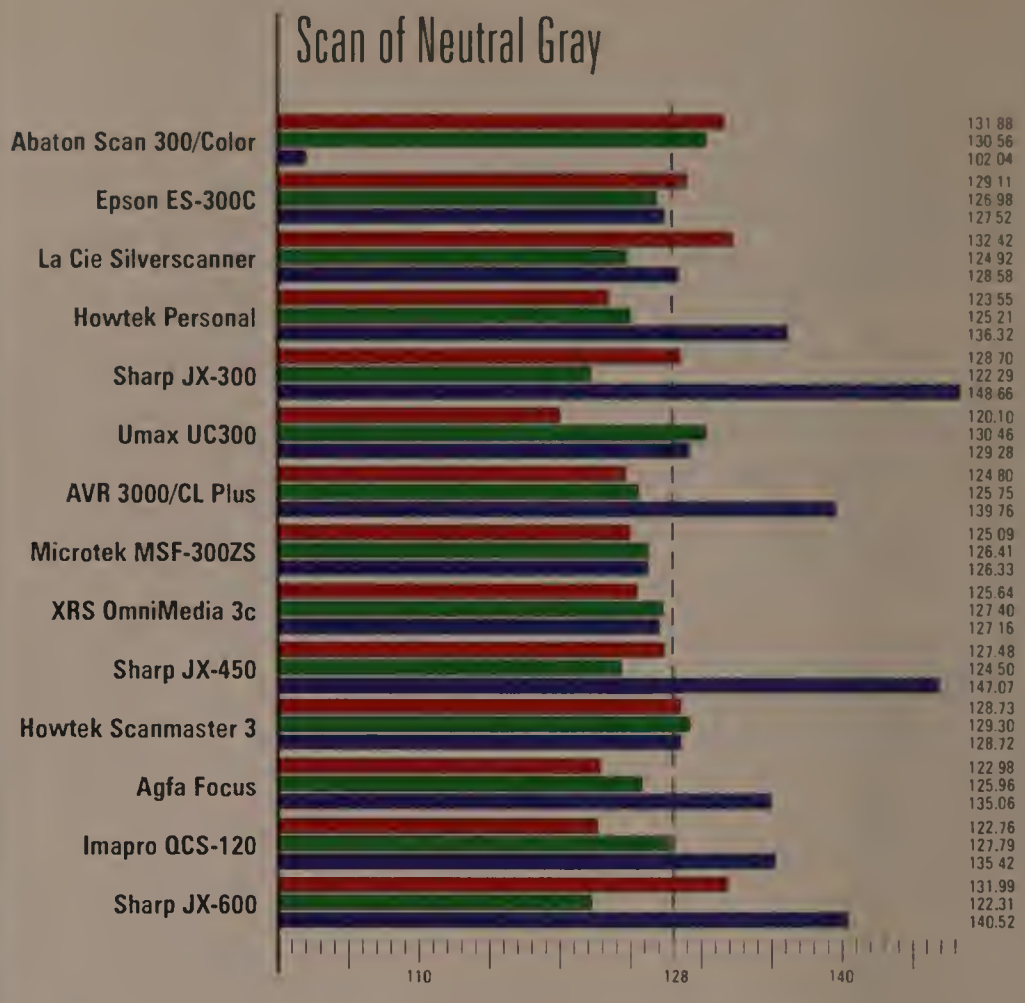
lines per inch). If you're using a 150-line halftone screen, for instance, a 400-dpi scanner lets you more than double the output size of the film you scan, and with a 600-dpi scanner, you have enough data to blow up a 35mm slide to a width of 3 to 4 inches, or take a 4-by-5-inch transparency and print it as an 8.5-by-11-inch image. And if you are working at a newspaper or other publication that prints at even lower halftone resolutions, you can almost double the maximum size limit just quoted.

There are other ways to characterize resolution, however. Scanners like the La Cie, the Agfa, and the JX-600 quote resolutions that are non-proportional (300 by 600, 400 by 800, and 600 by 1200, respectively). Non-proportional sampling can slightly improve the sharpness of halftones and line art.

If you want to scan line art, a far more important feature to look for is the ability to interpolate data during scanning. The process of interpolation enables some software modules to push a scanner's resolution beyond the unit's optical maximum. For example, the Photoshop module in the Silverscanner offers a resolution setting of 1200 dpi. The software achieves the interpolated resolution by looking at a matrix of sample points and making educated guesses about what the points between those points would look like.

On the Bias: A Balance Test

Measured in gray-scale increments



This test looks for bias in a scanner toward one or more colors. A gray card made with paint specially designed to reflect equal amounts of red, green, and blue was scanned. The scans were corrected so that the mean values of the combined layers all equaled 128, or middle gray. Then Photoshop's histogram was used to compare the values in the red, green, and blue channels of each scan. Ideally, all values should be 128. The graph shows the absolute readings for each scanner. Although you can use software to bring scans back into balance, the more pronounced the bias, the more your correction compromises image quality. Products are arranged from least expensive to most expensive.

Transparent Issues

If your main purpose in buying a color scanner is to scan color photographs for high-quality print publication, you'll be better off with a dedicated slide or transparency scanner that is optimized for high-resolution scanning (see "Other Options"). Even the 600-dpi scanners reviewed here simply don't offer the resolution necessary for enlargement and manipulation of transparencies in extremely high-end applications.

But if you want to scan film only occasionally, or don't need high-resolution output, five of the flatbeds offer transparency attachments that might meet your needs; two more are coming in April. This added flexibility can be convenient, since photographers often submit transparencies, and you can skip the step of making a print to scan from. You also retain image quality this way, since you scan from the original film instead of from a print made from that film.

The Sharp Electronics JX-600, the XRS OmniMedia 3c, the Howtek Scanmaster 3, and the Imapro QCS-120 offer transparency attachments that disable the main scanning bulb and substitute a light mounted on a movable boom above the scanning bed. The JX-450 offers a mirrored unit that achieves a similar effect, directing the internal light source's beam through the mounted transparency, and into the scanner's sensor. Transparency scans are often better than reflective scans, but you may get higher intensity and more saturated color at the expense of some details in the shadows (see "Tonal Trade-offs").

Another problem I had with these attachments was that they were all kludges, obvious retrofits. When I buy a $13,000-to-$15,000 device like the Imapro QCS-120 or the Sharp Electronics JX-600, it's galling to have to use *cellophane tape* to fix the film in place (as per the Imapro manual!) or to cut out little paper scrims. Nor do I appreciate the JX-450's flimsy, plastic transparency holder (the holder in the evaluation unit I received was, predictably, quite scratched); for $500, this gear should look like good photographic equipment, not something from a toy store. To install the moving transparency boom in the OmniMedia 3c scanner, XRS cuts a big hole in the side of the scanner, and the company doesn't provide a cover. Dust coming in through this hole and settling on the optical assembly could build up as time goes on. The company does sell a cleaning kit for $10 and has announced that it's redesigning the adapter to close the hole somewhat; the new design may be out by the time you read this.

Performance on Paper

(A) High-end reference scan



(B) Nikon LS-3500 Film Scanner



(C) Imapro QCS-120



(D) Sharp JX-600



(E) Howtek Scanmaster 3



(F) La Cie Silverscanner



If you take a close look at the color separations printed here, you'll be able to distinguish several characteristics that determine just what I mean by good image quality. Look, for instance, at the man's face. His hair and left ear are very dark parts of the image, and some scanners simply can't distinguish the shadow details, those that lurk in the dark gray and black areas of the image. Another thing to look at are the highlight details, those that lie in the lightest parts of an image. These are visible in the lace of the girl's headband. Some scanners do a better job at finding the lace texture and gradations of the fabric; with other scanners these details simply disappear. Sharpness, or the ability of a scanner to pick out small details in an image, can be compared by looking at the edges of the metal bangles and by the edges of the ribbons in the girls's outfit. And lastly, take a look at the purity and balance of the colors in a scan. The reds and greens of the girl's clothes should look vibrant and bright, not muddy brown or orange. (A) was made with high-end prepress equipment, while (B) was scanned using a Nikon LS-3500 Film Scanner, the machine that set the desktop standard in our previous articles. (C) is a 600-dpi transparency scan from the Imapro QCS-120. (D) is a 600-dpi transparency scan from the Sharp Electronics JX-600. (E) was scanned from a print on the Howtek Scanmaster 3 at 400 dpi. (F) was made on a La Cie Silverscanner at 300 dpi.

20/20 Vision

There are a few other hardware considerations that are difficult to quantify but important to consider when shopping for a scanner. The resolution may determine the amount of information a scanner can extract from an image, but the optics in the unit, the lens assembly that focuses the light onto the scanning array, also play a big part in producing quality scans. The quality of the materials used, and the care taken in the design and manufacture of the unit, greatly affect the amount and focus of the light that reaches the scanning sensors.

I tested the scanners' registration by scanning a piece of line art that had been printed on an imagesetter and examining the resulting scan at high magnification in Photoshop. Misregistration of the red, green, and blue layers in a scan can cause halo effects and soften details. The sharpest scans produced a line that was virtually all black; the fuzziest scans produced a line that looked like a rainbow when viewed at high magnifications. The winners in this test were the Howtek Personal Color Scanner, the Imapro QCS-120, and the Sharp Electronics JX-600. The scanners that showed the most registration problems were the Abaton Scan 300/Color, the Epson America ES-300C, the La Cie Silverscanner, the Sharp Electronics JX-300, and the XRS OmniMedia 3c, which was by far the worst of the lot. (XRS says a firmware upgrade that will fix this registration problem should be available by the time you read this.)

Lastly, there are two other hardware considerations to keep in mind; one affects your wallet, the other your patience. The three Sharp Electronics scanners, the Howtek Scanmaster 3, and the Imapro QCS-120 all require a General Purpose Interface Bus, or GPIB. Don't consider any of these scanners unless you have an open slot in your Mac. If you already have a GPIB board for some other device, you may not need to spend almost $600 on a new one. Ask the scanner manufacturer about compatibility with what you already own.

And make sure to compare scanning speeds before you make a buying decision. Most prescans were in the 20-to-40-second range, but the Howtek Scanmaster 3 and the Imapro QCS-120 were the slowest—at 107 and 85 seconds, respectively. Most scans took about 1½ to 2 minutes to complete, but the Agfa Focus Color and the Imapro took 4.5 and 14 minutes each to scan the same piece of art.



From top to bottom: Microtek MSF-300ZS, Imapro QCS-120, Agfa Focus Color Scanner

Soft(ware) Touches

Until recently, a lot of scanner software simply didn't give you the necessary tools for getting usable scans. Today, scanner programs have generally all achieved a similar level of comfortable, reasonably efficient adequacy. Most of them offer the basic features required for getting the job done in a simple scanning utility. All now feature a preview scan window where you can select the portion of the image you want to scan, set resolution and scaling, and check readouts that compare the file size of the image to the available disk space. Really, that's all you need.

Keep that in mind when you go shopping for scanners, since many

COLOR SCANNER SHOPPING

Company	Product	Price	Interface/ Price	Maximum Optical Resolution (in dpi)	Scan Area (in inches)	Price/Number of Sheets
Abaton	Scan 300/Color	$1995	SCSI/included	300	8.5 × 14	● (50 sheet, $595)
Epson America	ES-300C	$1999	SCSI/$399	300	8.5 × 11.7	
La Cie	Silverscanner	$1999	SCSI/included	600v × 300h	8.5 × 11.7	
Howtek	Personal Color Scanner	$2295	Parallel/included [3]	300	8.5 × 14	
Sharp Electronics Corporation	JX-300	$2345	GPIB/$570 [4]	300	8.5 × 11	
Umax Technologies	UC300 Color Scanner	$2495	SCSI/included	300	8.5 × 14	● (25-sheet, $525)
AVR	AVR 3000/CL Plus	$2590	SCSI/included	300	8.5 × 14	● (100-sheet, $795)
Microtek	MSF-300ZS	$2695	SCSI/included	300	8.5 × 14	
XRS	OmniMedia 3c	$4500 [5]	SCSI/included	300	8.5 × 14	
Sharp Electronics Corporation	JX-450	$5995	GPIB/$570 [4]	300	11 × 17	
Howtek	Scanmaster 3	$6995	GPIB/$1200 [6]	400 [7]	11 × 17	
Agfa Compugraphic	Agfa Focus Color Scanner	$7995	SCSI/included	800v × 400h	8.25 × 11.75	
Mitsubishi International	SC-7500	$8950 [8]	SCSI/included	400	11 × 17	
Imapro Corporation	QCS-120	$11,990 [10]	GPIB/$595 [4]	600	5.8 × 17	
Sharp Electronics Corporation	JX-600	$14,995	GPIB/$570 [3,11]	600 [12]	11 × 17	

● = yes, — = no. [1]AP = Apple Scanner emulation, CS = ColorStudio available from scanner vendor, DD = Digital Darkroom; IS = ImageStudio; PXS = PixelScan (PixelPaint utility), PS = Photoshop available from scanner vendor; QX = QuarkXPress; RT = RagTime; S8 = Studio/8. [2]Extended warranty available. [3]SCSI version planned. [4]Compatible with other National Institute GPIB boards [5]OmniMadia 3cx, $5400, 300 dpi with special X-Ray features.

software makers now offer a lot of features that don't mean much in the final analysis. For example, some scanners offer options designed to correct an image—for sharpness, brightness, contrast, and color balance—while you scan. These are supposed to be more convenient and higher in quality than after-the-fact corrections. But for virtually all the scanners under review, it's just not true. For on-the-fly corrections to make a difference, the scanner's analog-to-digital converter must deliver more than 8 bits for each of the channels (red, green, and blue) in a 24-bit image. A $70,000 scanner, like the Optronics ColorGetter, delivers 12 bits of information per color channel, giving correction software room to sift and sort and then deliver an optimal 8 bits. But when you start with 8 bits, you can only go down from there. In practical terms, that means correction may give you the bright colors you're after, but at the expense of image detail—particularly in the shadows—and subtle shadings.

But specs don't mean everything. You'd think that the JX-600, the only 10-bit scanner evaluated here, would offer better results over its rivals in terms of these corrections, since it has more data to work with initially. Alas, despite using the ColorStudio driver, designed to make best use of the JX-600's abilities, this scanner turned in worse-than-average scores in the color tests, and muddy-looking separations (see "Performance on Paper").



Tonal Trade-offs Transparency scans typically display brighter colors than scans of prints, but often lack detail in shadow areas. The print separation on the left was made with a Microtek MSF-300ZS. The XRS OmniMedia 3c, the same machine as the Microtek with an added transparency option, was used to scan the image at right.

Correcting while scanning isn't even particularly convenient, since you rarely know in advance exactly how much correction is required. Consequently, you have to keep rescanning until you get the desired result. In fact, for virtually any kind of sophisticated image processing and correction, you should use a dedicated image processing program such as ColorStudio or Photoshop. After all, these programs provide the best tools available for editing color images. None of the scan modules, for example, offer an on-screen densitometer or histogram. Without such readouts you have no numerical information about the color values in a scan; you must make your best guess based on what you can see. It's also far easier to sharpen and color correct interactively with these programs, so you can see the results of corrections on screen and easily Undo and start over. Finally, the developers of dedicated image processing

Transparency Attachment/ Price	Warranty	Software Available	DA Available	Plug-In Modules [1]
/NA	1 year [2]	Adobe Photoshop ($495)	gray-scale	AP, DD, IS, PS ($69)
/NA	1 year [2]	ColorStudio and ImageStudio ($200); Photoshop (included)	black-and-white, color	AP (due in April), CS, PS (due in April)
NA	1 year	Aldus Preprint and Photoshop LE (included)		AP, CS, DD, IS, PS
NA	1 year [2]	Adobe Photoshop LE ($300), MacScan-It (included)		PS
NA	6 months	ChromaScan w/GPIB		IS, PS, PXS, S8
For X Rays/$3195	1 year [2]	Adobe Photoshop LE (included)	color	AP, DD, PS
NA	1 year	Adobe Photoshop LE (included)		AP, PS
● $2000 from XRS	6 months	Adobe Photoshop (included)	black-and-white, color	DD, IS, PS
● included	1 year [2]	Adobe Photoshop (included)	black-and-white, color	CS, IS, PS
● $500	6 months	ChromaScan w/GPIB		IS, PS, PXS, S8
● $659	1 year [2]	MacScan-It, Adobe Photoshop (included) [6]		PS
Due in April/TBA	3 months [2]	MC View ($695)		AP, CS, PS, QX, RT
	6 months [2]	Adobe Photoshop (due in April)		CS
● included	3 months [2]	SpectreScan ($1495)		
● included	6 months	none		PS

[6] Sold only as part of interface kit, which includes MacScan-It and Photoshop. [7] 800v × 400h dpi upgrade planned. [8] GPIB, MacScan-It, Photoshop available as interface kit, $1200. [9] GPIB interface also available, $8450, 300 dpi. [10] QCS-450, $9990, 300 dpi. [11] SCSI version available but unsupported by software [12] Free 1200v × 600h dpi upgrade available.

Am I Blue (Green or Red)? A Saturation Test

Measured in percentage of contamination



The results presented here and in "On the Bias: A Balance Test" provide a rough but accurate indicator of a scanner's ability to capture bright, clean colors. Color contamination (presence of the remaining two primary colors found in a scan after sampling information on the third color) is much more difficult to correct for than bias.

Swatches of red, blue, and green from a standard color chart (the Macbeth Color Checker) were scanned. The amount of red, blue, and green in all three swatches were then measured using Photoshop's histogram. The figures in the graph show the contaminating colors expressed as a percentage of the dominant color.

Since there is no standard definition of what blue, red, and green are, the results shown are only of relative value. Greens are typically less pure than reds and blues. The overall higher contaminating values observable in the green test result from higher red and blue values present in the original green swatch.

Generally speaking, the less contamination registered in this test, the more likely a scanner is to produce bright, clean, and accurate colors in a scan (see "Performance on Paper"). Products are arranged from least expensive to most expensive.

programs have staked their reputations on the technology; for processes like resampling and sharpening, they can be counted on to use the best available algorithms.

The good news is that you can now buy an image processing program in the same box with a scanner. The Microtek, XRS, and Howtek Scanmaster 3 scanners come bundled with Photoshop. The La Cie, Umax Technologies, and AVR units offer Photoshop LE, which is Photoshop without color-separation features. Photoshop LE can be upgraded to Photoshop for $250. And if you already own an image processing program like ColorStudio or Digital Darkroom, look for a vendor that offers a plug-in module for it. These plug-ins are scanning utilities that you drop into an image processing applications's folder; they allow you to run the scanner without leaving the image processing program. That way you can scan, use histograms or a densitometer to analyze an image, use good tools to correct color and sharpen, and then save, all in one operation. This is by far the most convenient way to operate a scanner. If you can't find the plug-in that you need listed in "Color Scanner Shopping," contact the scanner manufacturer or software publisher to see if one is available.

Finding the Flatbed for You

Here's my list of recommendations for scanners. (The price listed includes the cost of a transparency option and interface board, where applicable, and image processing software.)

If you need 600 dpi and format flexibility, and you don't need to print at high resolutions, the Imapro QCS-120 ($14,080) is a good choice. It provides good-quality scans, though the color could be a bit cleaner. There are two drawbacks to this scanner: you can use only a 5.8-inch strip down the center of its 11-by-17-inch scanning bed; that means lots of dead space taking up room in your work area. And the QCS-120 is by far the slowest scanner tested, requiring 14 minutes to scan the test image. Its only competition here, the Sharp Electronics JX-600 offers much poorer scans, with muddier colors, less detail in shadow areas, and poorer details in the highlights.

If you can work with 400 dpi, Howtek's Scanmaster 3 offers the best value ($6995 plus a $1200 interface kit with GPIB, Photoshop, and MacScanIt). It offers 400-dpi scanning, a convenient transparency option, and reasonably good shadow detail in its transparency scans. Its main competitor, the Agfa Focus Color ($8690), may provide slightly better scans and is sturdily designed, but offers a smaller scanning bed, no transparency option (one is due out in April), and slower scanning speed (275 seconds versus 90 seconds).

You can save more than $2000 and buy a Sharp Electronics JX-450 for $7065 if 300 dpi is enough for you.

OTHER OPTIONS

Flatbeds aren't for everyone, or every purpose. The following list details some of the other options available, including a few new flatbeds that were unavailable for testing at press time.

Slide Scanners

- *Barneyscan CIS 3515* 1000 dpi; 8 bits per channel; $4495
- *Ektron Applied Imaging Eikonix 1435 Slide Scanner* 2800 dpi; 12 bits per channel; $9900
- *Howtek Scanmaster 35 Plus* 1333 by 2000 dpi; 8 bits per channel; $7549
- *Imapro QCS-35* 4233 dpi; 9 bits per channel; $12,990
- *Microtek ScanMaker 1850s** 1850 dpi; 8 bits per channel; $3195
- *Nikon LS-3500 Film Scanner* 4388 dpi; 8 bits per channel; $9995
- *Kodak 35mm Rapid Film Scanner* 950 dpi; 8-bit scanner; $8495

Flatbeds/Overheads

- *Chinon America DS-3000 Color Scanner** 300-dpi overhead (75 dpi in color mode); 8.5-by-11-inch scanning area; 4 bits per channel; no transparency; $995
- *Fujitsu M3096** 400-dpi flatbed; 11-by-17-inch scanning area; 8 bits per channel; transparency option available; $6500
- *Imapro QCS-600* 600-dpi flatbed; 11-by-17-inch scanning area; 8 bits per channel; transparency option included; $19,900.
- *Prime Option Phovos 400C** 400-dpi flatbed; 8.5-by-11-inch scanning area; 8 bits per channel; no transparency option; $6495.
- *Truvel TZ-3BWC* 900-dpi overhead; 12-by-17-inch scanning area; 8 bits per channel; no transparency option; $11,590.

Software Solutions

This program turns a gray-scale scanner into a color one by using red, green, and blue filters that you place on the scanner. The software then assembles each layer into a color composite.

- *Impact Research,* KaleidoScan, $149.99.

High-End Scanning Software

If you are working in a production environment or if you require more capable scanning software than that offered with most scanners, this company makes programs that automate scanning and image-correction functions.

- *Prepress Technologies,* SpectreScan, basic package $495; includes drivers for the Microtek, Epson, and La Cie scanners. Drivers for other scanners run $200 to $500.

** Prerelease at press time, features may change.*

You still get a large scan bed and a transparency option, though the mirror-based attachment is cumbersome and finicky—not recommended for everyday production. And although the JX-450's colors don't look as good as the more expensive Scanmaster's or Focus Color's, the JX 450's colors are better than the JX-600's.

If you buy the XRS OmniMedia 3c, a modified version of the Microtek MSF-300ZS, you pay $2000 less than for the JX-450, but you give up a large image bed. You still get 300 dpi, and a transparency attachment that produces decent scans, though not as good as the Sharp Electronics JX-450's. Your other option is to buy the Microtek ($2695) and later have XRS install the transparency option for $2000 (your scanner comes back a stylish black and sporting a new one-year warranty).

At the low end of the market, the choice is clear: if you don't need a large scanning bed or a transparency option, buy the La Cie Silverscanner. It is one of the least expensive models under review, and its scans are among the best. They are not as sharp as some others, because of the Silverscanner's poor registration, but the Silverscanner produces very clean, saturated colors—which is what people always notice first about a picture anyway. The Silverscanner is also fast, and it comes with a one-year warranty and a good selection of software, including one of the more flexible Photoshop drivers around.

Epson America actually makes the Silverscanner; the Epson America ES-300C is the same basic machine and carries the same list price. Look closer, however, and you'll notice that Epson America charges about $400 for a SCSI interface that La Cie throws in free, and another $200 for ColorStudio, ImageStudio, and a DA program. Unless you already have Photoshop and want the Letraset line, the La Cie is a better value and produces prettier separations.

If you do need a larger scanning bed, it's a draw between the Umax Technologies UC300 and the Microtek MSF-300ZS. Both have advantages; the Umax is $200 cheaper, and offers a sheet-feed option and a one-year warranty, while the Microtek has a cleaner color response, offers a transparency attachment, and comes with Photoshop.

A Divided Market

When *Macworld* first wrote about color scanners two years ago, two companies were selling a total of four flatbeds. The cheapest unit was the 300-dpi Sharp Electronics JX-300; it sold for $5000. Today it lists for $2345. Now 12 developers compete in the flatbed market, and the bulk of their new offerings list for under $3000. This heated competition makes it easy for consumers to get a lot for their money at the low end of the market.

But a premium price is still being charged for the higher-resolution models with transparency options. Two 400-dpi units have recently been announced that undersell current offerings by thousands of dollars (see "Other Options"). So if you are in the market for a flatbed scanner that serves well in demanding print publishing, it might be wise to hold off until the units reviewed here come down in price, or until higher-end features, such as 12-bit scanning, become available at current midrange prices. After all, while it's often quite useful to employ a jack of all trades, it's no fun to pay master rates for journeyman talents. ■

See *Where to Buy* for contact information.

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Optical OUTLOOK

Once exotic, erasable optical drives enter the mainstream

by Charles Seiter

DROWNING IN HUNDREDS OF megabytes of prepress work, digitized sound, multimedia presentations, or color graphics? Finding your hard drive—the 150MB one you once considered a monster—constantly filling up? Look for relief in a growing range of faster, cheaper erasable optical drives.

If you regularly deal with more data than can be stored conveniently on a hard drive, or if you require an absolutely stable backup medium for archival purposes or for carrying between offices, erasable optical technology offers the best solution. And now is the time to buy, because prices for these systems have plummeted.

This article examines the performance of 22 erasable optical drives (see "Erasable Optical Overview"). I also take a first look at some promising newcomers, including Pinnacle Micro's REO-130, the first erasable optical drive that uses 3½-inch media; and units that combine erasable and WORM (write-once, read-many) capabilities.

Over the last few years of optical evolution, drives and drive subsystems have become standardized products. Virtually every 5¼-inch magneto-optical drive supports one of the two disk formats specified by the International Standards Organization (ISO), so cartridges from one drive can typically be used, or at least read, by other drives with the same mechanism. Standardization simplifies answers to the inevitable question "Which drive is right for me?" Vendors now have trouble charging much of a new-technology premium for their offerings.

You can't be in the technological avant-garde with one of these machines anymore, but console yourself by saving thousands of dollars compared to the pioneers.

The Laser Eraser

Both the advantages and the limitations of erasable optical drives derive from their magneto-optical read-write technology (see "The Magneto-Optical Approach"). These drives combine a laser and an electromagnet. On a high setting the laser writes to the disk by producing a set of heated spots that the electromagnet then magnetizes, converting them into the equivalent of 0 and 1 bits on a standard magnetic disk. On a low setting the laser reads the disk by using a

PHOTOGRAPHS BY STAN MUSILEK



variation in the way polarized light reflects off the magnetized spots.

Because lasers focus tightly, they can write huge amounts of data to a small space. And the trend points toward lasers with increasingly shorter wavelengths and tighter focus. In the next few years, the data density on optical disks could increase by a factor of four, improving speed as well as capacity.

Erasable optical drives also offer significant data-security advantages over standard magnetic hard drives. Magneto-optical media are magnetizable, therefore vulnerable, but only when heated. So, erasable optical disks are safe in stray magnetic fields—a key advantage over using magnetic hard drives for mass storage. Also, the media-destroying head crashes that plague magnetic systems just can't happen here because the head never touches the media. And the superbly engineered lasers, magnets, and motors in magneto-optical drives could easily be running long after you retire.

Because the laser used in a magneto-optical system is powerful enough to heat the disk media in a few thousandths of a second, a modified mechanism and software driver enable the unit to use WORM media, on which the laser effectively burns a nonerasable spot to record a data bit (see "More than Meets the Eye: Multifunction Optical Drives"). For that matter, at least two manufacturers are developing systems that can also read CD ROMs.

But magneto-optical technology also carries burdensome technical drawbacks. The drives tested for this article run an erase cycle before writing, then perform a separate verify cycle, which makes writing performance slow compared to reading.

Because laser assemblies are complex and expensive, erasable optical drives use only one per system. They read only one side of the disk, unlike standard magnetic hard drives—whose multiple drive heads read both sides of several disk platters simultaneously, from above and below. This gives hard drives an inherent advantage in seek times. You must eject optical disks and turn them over to access their full capacity. One of the few ways to improve disk-access time in these drives is to scan a smaller area. The 3½-inch Pinnacle system that has recently appeared on the market exploits this tactic (see "Little Wave of the Future").



A magneto-optical disk platter (top) resembles a CD ROM, except for the darker color caused by metal oxides that allow magnetization. In contrast, a WORM platter (right), which is made up of a polymer rather than metal oxides, is clear blue. Panasonic's all-optical media (left), made from a proprietary mixture of rare-earth oxides, take on a smoky, iridescent hue, and written zones are clearly visible.

LITTLE WAVE OF THE FUTURE

Building a storage-and-backup system from scratch? For a cheap and effective strategy, get the fastest 150MB hard drive on the market and link it to the first small-format erasable optical drive. The 3½-inch REO-130 from Pinnacle is the brightest spot in optical storage.

After pounding out benchmarks on more than a score of larger drives, it is a discouraging point to make, but the REO-130 looks like the first mammal in a world of dinosaurs. The smaller format gives it fewer tracks to search, guaranteeing a quicker seek time—about half that of the larger drives. This faster seek time compensates for modest SCSI read-write performance, so that in application-bound tasks, the REO-130 comes in within a second or so of the fastest bigger drives. And at $2995, the REO-130 is cheaper than all but one of its big brothers (the $2599 MacProducts USA Magic 600 Optical ISO).

The cartridges for this type of drive look just like standard Mac floppies, except for the glimpse of mirror-rainbow you see when you slide open the little metal window on the disk. After formatting, these single-sided cartridges hold 122MB; they retail for $129.

Finally, because these disks are the same size and shape as Mac floppies, they make storage, archiving, and mailing a snap. As competition builds in this format, the speed and convenience should be accompanied by even lower prices. (At press time, Ocean Microsystems and TASS International had announced but were not shipping their own 3½-inch units.) For now the REO-130 stands out as an elegant solution for storage and data-exchange problems.

ERASABLE OPTICAL OVERVIEW

Company	Product	Drive Price	Cartridge Price	Formatted Capacity	SCSI ID	Termination	Bundled Software [1]
CANON DRIVES							
Mass Microsystems	DataPakMD	$4349	$220	470MB	DIP switch	external	DiskDoubler
MicroNet Technology	CMD-1	$4295	$229	462MB	DIP switch	external	
MAXTOR DRIVES							
DJK Development	TED-Dne	$5299	$279	900MB	push button	external	
Storage Dimensions	MacinStor Erasable Optical 1000	$6695	$295/$395 [2]	900/572MB [3]	push button	external	Retrospect
MOST DRIVE							
Pinnacle Micro	RED-130	$2995	$129	122MB	push button	external	Deadbolt, HD Utilities
RICOH DRIVES							
Deltaic Systems	DptiServer 600	$4599	$199	582MB	push button	external	
Iomega Corporation	LaserSafe	$4999	$249	582MB	DIP switch	internal/switchable	Iomega Workshop
MacProducts USA	Magic 600 Optical ISD	$2599 [4]	$249	582MB	DIP switch	external	10MB of shareware, demos
Mirror Technologies	RM600	$2997	$249	570MB	DIP switch	external	MockPackage
Relax Technology	Erasable MD Vista	$3129 [5]	$229	570MB	DIP switch	external	
Xyxis Corporation	XY600RW	$4995	$275	566MB	DIP switch	internal/switchable	
SONY DRIVES							
Alphatronix	Inspire	$5495	$250	624MB	DIP switch	external	
Conversion Dynamics	Dptirase	$4250	$225	582MB	push button	external	
FWB	hammerDisk600S	$5495	$275	582MB	DIP switch	external	Deadbolt, HD Utilities
La Cie	La Cie 600 Magneto Optical	$4299	$259	582MB	DIP switch	external	Silverlining, shareware
MicroNet Technology	SB-SMD-1	$4995	$289	582MB	wheel	external	
Microtech International	Microtech DR650	$4795	$249	624MB	DIP switch	internal/switchable	Norton Utilities, Total Recall, shareware
Ocean Microsystems	Tidalwave 650	$4195	$249	582MB	push button	external	
Pinnacle Micro	RED-650	$3995	$249	624MB	push button	external	
PLI	Infinity Optical	$4699	$299	582MB	wheel	external	Turbo utils, Access Managed Env.
Procom Technology	MEDD-650	$4945	$295	582MB	DIP switch	external	Retrospect
SuperMac Technology	LaserFrame	$6499	$295	582MB	DIP switch	external	DiskFit 1.5

[1] All drives bundle formatting/partitioning software. [2] P rices are for 650MB and 1GB cartridges, respectively. [3] 1GB and 650MB cartridges, respectively. [4] A non-ISO -compatible version of this drive, the Magic 600 Optical, sells for $1999. [5] Another version of this drive, the Erasable MO Plus, comes with a built-in power control center and sells for $3149.

The Meaning of Speed

Speed measurements can be deceiving, so consider the context both of manufacturers' claims and of the benchmarks offered here (see "Speeds of Light"). The fastest magneto-optical drives now offer SCSI read-write times about one-third as fast as those of most medium-capacity (115MB to 250MB) hard drives (see "Midrange Hard Drives, Just Right," *Macworld,* March 1991), and about one-eighth the average speed of hard drives larger than 160MB (see "Huge Hard Disks," *Macworld,* November 1990). For any higher-end Mac, the speed penalty will be apparent. But if you intend to connect an erasable optical drive to a Mac Plus you probably will not notice the difference, because the SCSI port on the Plus is slower than either the hard drive or the optical drive.

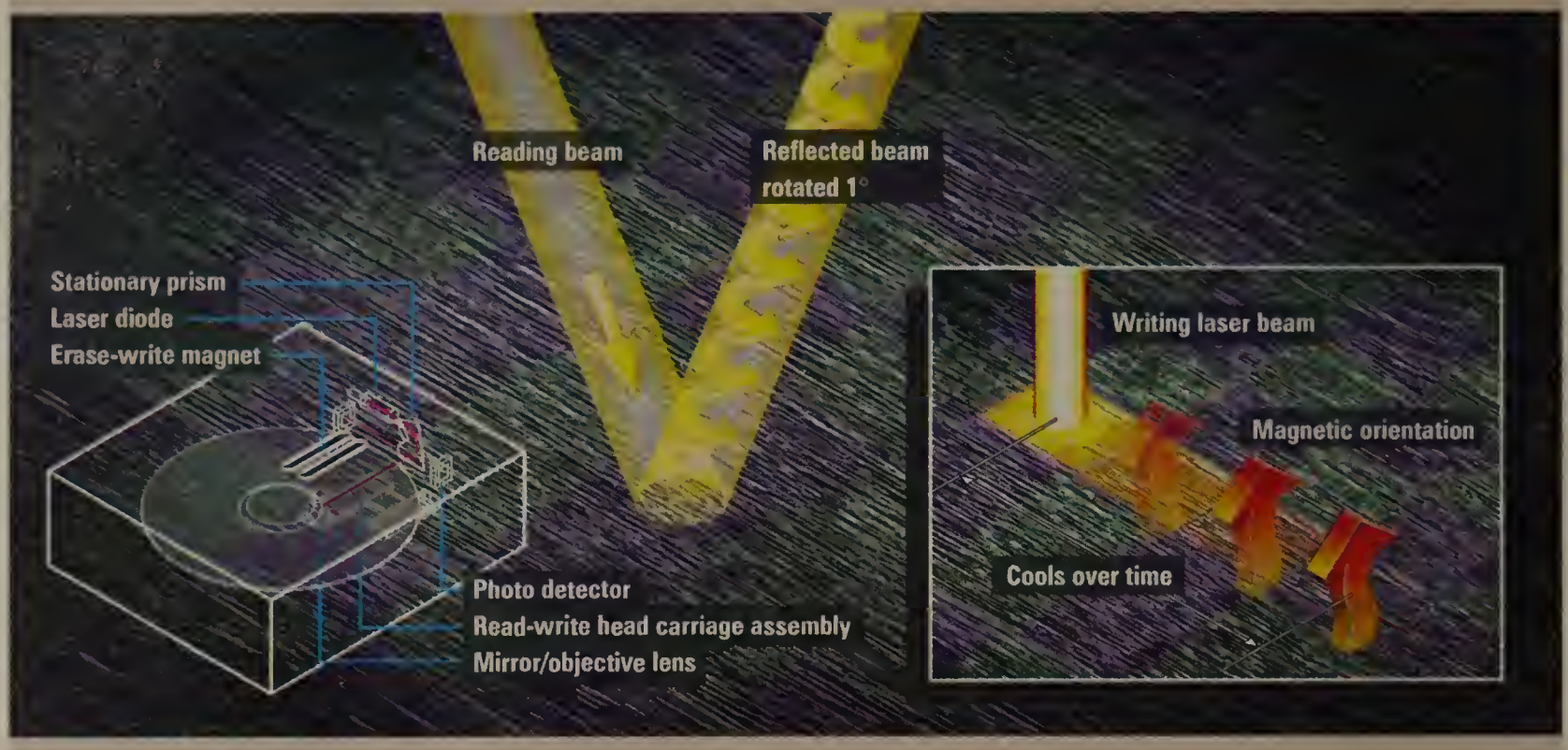
The performance test results show just how effectively the Finder and familiar Mac applications suppress speed differences among drives. While SCSI read-write times vary significantly, benchmarks involving typical real-world applications generally show only small differences from one optical drive to the next.

The Macintosh Operating System accounts for part of this apparent contradiction because it verifies writes in tiny, 2K steps. A blind-transfer utility will show that these drives can greatly speed up SCSI times by bypassing the verify cycle. But faster SCSI scores still do not necessarily translate into better practical performance. The new Canon-based erasable optical drives vividly demonstrate this fact; they are SCSI-read benchmark champions because of higher disk-rotation speed, but this speed doesn't give them any notable edge in other tests.

Only the file-transfer figure tells you with assurance whether to expect additional usable speed for your money. The other benchmarks indicate that the speed information often quoted in advertisements—burst-transfer rate or disk-rotation speed, for example—does not translate into impressive benefits in daily use.

These fine points about speed are critical because they define the ways in which a magneto-optical drive can be used effectively. For example, nearly all these drives ship with software that lets you pick the optical as

The Magneto-Optical Approach



In a magneto-optical drive, a laser and a magnet work together to record data. To write (inset), a strong laser beam heats a spot on the media platter. When heated, metal oxides within the media become magnetizable. A magnet operating from the opposite side of the platter changes the orientation of the spot to either a 0 or a 1, before the spot cools. To read the media, the drive adjusts its laser beam to a weaker setting (center). As it reflects back to the drive head, the polarization of that beam rotates approximately 1 degree, either left or right, depending on whether the spot is a 0 or a 1. The drive's photo detector (diagram at left) then analyzes the beam to determine the spot's orientation.

your start-up drive. Since you must be dealing with large amounts of data to be considering one of these systems in the first place, you would be hard put to find a worse choice for a startup drive than any currently available magneto-optical. It would mean *always* waiting several minutes to load or save large page-layout, color-graphics, or CAD files.

And don't expect dramatic speed improvements anytime soon; in fact, the numbers reported here *are* the improvements, in some cases 100 percent better than last year's figures ("Erasable Opticals: New Light on Data," *Macworld,* March 1990). Similarly, although some companies recommend their drives as network servers, any users on the net who have disk-intensive tasks will be considerably happier hooked up to a big, fast, hard drive than to one of these reliable but poky units.



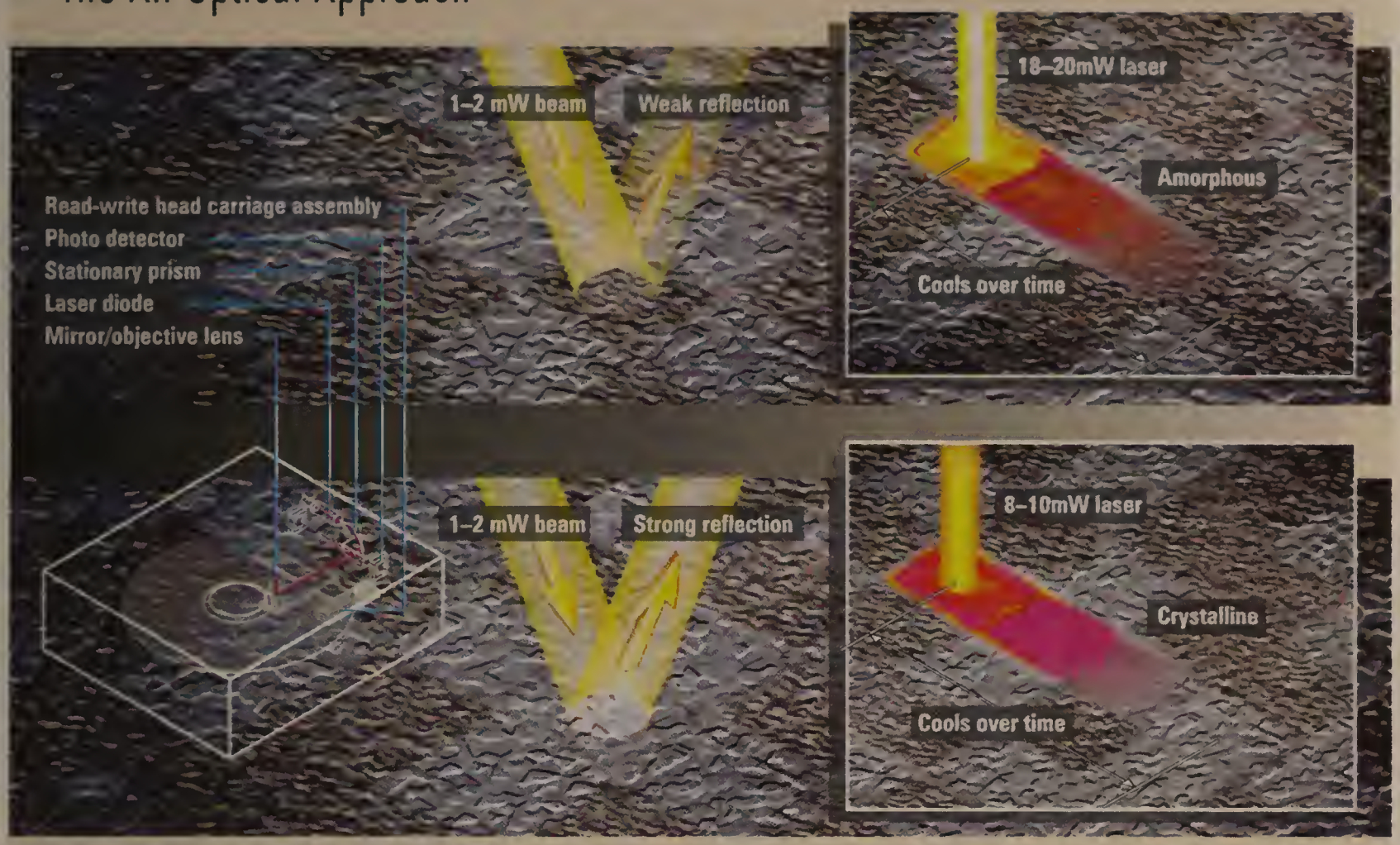
Pinnacle Micro's REO-130 is the first erasable optical drive that uses 3½-inch media.

Flexible Archiving

Magneto-optical systems occupy a storage role somewhere between hard drives and backup-only devices, such as tape drives. Magneto-optical technology allows what might be called "interactive archiving." In a graphics shop, for example, you could daisy-chain an erasable optical drive to a speedy hard drive and assemble stable, crash-proof archives for individual customers in their own partitioned (and password-encoded) volumes. You might find a magneto-optical drive too slow to be satisfactory as a network server, but it makes a superior backup device for a hard drive–based server, providing the network manager a variety of fast ways to select archival files. No other storage product offers this combination of versatility, convenience, and security.

And when I say archival, I mean the potential for *massive* data storage. A gigabyte may seem like a lot of space—until you fill it up with

The All-Optical Approach



Panasonic's phase-change technology is the first erasable optical system that does not rely on magnets. Instead, a laser converts a spot on the medium to either an amorphous state or a crystalline state. To write a 1 (top right), the drive increases the strength of its laser beam to 18–20mW, creating a much hotter spot, which cools to an amorphous state. To write a 0 (bottom right), a weak, 8–10mW laser heats a spot, which then cools to a crystalline state. To read the 0's and 1's (center, top and bottom), the system uses a low-power, 1–2mW laser beam, and the drive's photo detector (left) measures the strength of the reflection from the medium; a strong reflection for crystalline spots, a weak one for amorphous spots.

prepress work, companywide customer databases, or digitized satellite photos. But how can you keep track of many gigabytes of data? Optical drives offer a solution: the *jukebox*. By using a simple mechanism that pulls cartridges from a stack and swaps them into the optical drive subsystem, these machines put many gigabytes on line, albeit with a short delay for switching volumes.

Pinnacle's $49,950 REO-36000 handles 56 disks for a total capacity of 36GB. The Alphatronix Inspire ImageQuest, with a base price of $57,900, offers the same capacity and bundles a 16-disk, removable JobPack with the drive. Other vendors, such as FWB, will customize their systems with third-party cartridge-change hardware on request.

Finally, there is a smaller species, the desktop jukebox, which holds 10 magneto-optical disks. Pinnacle carries one called the REO-6500 for $9995 and TASS International has announced but has not yet shipped its Desktop Jukebox.

Wheat versus Chaff

Before you buy, consider the relative significance of a particular drive's features. For example, a rotary switch or push button makes setting SCSI IDs easy compared to fiddling with tiny DIP switches; but in the entire time you own the drive you probably will spend less than a minute making ID changes.

Companies also may overrate the value of software bundled with their drives. A good selection of utility software deserved commendation when all drives cost $6000—the case two years ago. Now that prices for erasable optical drives vary widely, bundled software beyond the basic drive INIT and formatter (which always provides partitioning capability) is almost irrelevant. How much is it worth to you that a vendor bundles the Norton Utilities, Total Recall, or Retrospect with a drive, useful though those utilities may be? You could buy all of them yourself for a few hundred dollars, so their inclusion doesn't logically justify a price premium much beyond their list price.

This leaves three basic guideposts for your buying decision: reliability, price, and (with due consideration of the grains of salt noted above) speed. Drives based on Sony, Maxtor, and

Speeds of Light

All times are in seconds

File Transfer

The time to transfer a 10MB mix of large and small real-world files from a 40MB Quantum hard drive.

Word Open

The time to open a 35-page Microsoft Word document.

FileMaker Pro Sort

The time to sort 500 records by one field.

SCSI Tests

Kilobits of data transferred per second, measured with the SCSI evaluator utility.

	File Transfer	Word Open	FileMaker Pro Sort	SCSI Read	SCSI Write
FWB hammerDisk600S (S)	160	17	28	3063	1858
Pinnacle Micro REO-130 (Mo)	190	17	28	2533	1573
DJK TEO-One (Ma)	186	20	26	2122	1918
Ocean Microsystems Tidalwave 650(S)	202	17	28	1687	1727
SuperMac LaserFrame (S)	195	18	28	2454	1781
La Cie 600 Magneto Optical (S)	214	18	26	1684	1738
PLI Infinity Optical (S)	214	18	26	1684	1866
Pinnacle Micro REO-650 (S)	195	17	30	3031	1924
Conversion Dynamics Optirase (S)	214	18	27	1684	1818
Storage Dimensions MacinStor EO 1000 (Ma)	198	18	30	3000	1061
MicroNet SB-SMO-1 (S)	238	16	31	2426	1127
Iomega LaserSafe (R)	212	19	29	2133	1645
Relax Erasable MO Vista (R)	274	17	28	2489	856
MacProducts Magic 600 Optical ISO (R)	288	16	29	2541	870
Alphatronix Inspire (S)	200	20	31	3053	1894
Deltaic Systems OptiServer 600 (R)	229	18	31	1621	1324
Microtech OR650 (S)	243	19	30	2047	1924
Procom MEOD-650 (S)	279	20	28	1203	856
Xyxis XY600RW (R)	288	21	29	1850	737
Mass Microsystems DataPakMO (C)	250	20	34	3891	1274
Mirror RM600 (R)	269	24	30	2380	868
MicroNet CMO-1 (C)	321	28	35	4018	1178

50 5 5

C = Canon drives; Ma = Maxtor drives; Mo = Most drive; R = Ricoh drives; S = Sony drives.

The products are listed by overall performance in the real-world tests. As these benchmarks show, the wide differences in SCSI-evaluator figures do not reliably predict real-world performance. The file-transfer figure represents the best gauge of additional usable speed for your money, in part because it tests the most likely routine use for erasable optical drives—backup.



Relax Technology's Erasable MO Vista (top) offers economy and respectable benchmarks for a Ricoh-based drive. FWB's hammerDisk600S (center) is the speed champion. Ocean Microsystems' Tidalwave 650 is both fast, and for a Sony drive, inexpensive.

Ricoh mechanisms show comparable reliability reports—and I don't expect the newer Canon machines to do worse—eliminating this as a clear dividing line. Therefore, your choice of a drive depends on your priorities for speed and economy. The generally costlier Sony and Maxtor drives operate, on average, faster than their generally less-expensive Canon and Ricoh competitors.

If you have frequent needs to archive or transfer hundreds of megabytes of data, choose a Sony or Maxtor. For routine use, the speed differential stands out. But which Sony or Maxtor? The comparisons are elementary. Compare, for example, the Pinnacle REO-650 at a suggested retail price of $3995 to the SuperMac LaserFrame at $6499. Both take 650MB cartridges and both are fast. The Pinnacle unit bundles only an INIT for start-up, and partitioning software, while the LaserFrame features DiskFit 1.5 for backup

MORE THAN MEETS THE EYE: MULTIFUNCTION OPTICAL DRIVES

The engineers who build magneto-optical drives noticed that if you have a laser and a mechanism for spinning disks, you have the means to create a drive that can function not only as an erasable, but as a WORM drive as well. WORM drives ideally suit a narrow range of jobs—primarily keeping track of legal and medical records, and maintaining government records that must not be changed, such as computer-access logs.

Drives based on a Pioneer mechanism that offers both erasable and WORM abilities have recently appeared on the market. Panasonic's new all-optical drives also feature both WORM and erasable modes. Panasonic units are currently being packaged by other companies and may be available to consumers when you read this.

The Pioneer DE-S7001 drive (which is sold exclusively through other companies) offers 316MB per cartridge side, after formatting, for both erasable and WORM. Pioneer uses a new ISO media format called sampled servo, in contrast to the continuous-servo format that characterizes all earlier magneto-optical drives. Sampled servo allows faster positioning of the read-write head. Vendors have not yet optimized this feature, but look for speed improvements in coming months.

Another encouraging point about Pioneer units is their relative value: the recommended retail price is $4495. PCPC offers the WORE 650, a unit bundled with network backup software, for $4495; Relax sells a $4695 unit that fits in its DeskTop Tower system. Using driver software from Corel Systems and Optical Access International, the Pioneer units in magneto-optical mode perform about as well as a fast Ricoh. The WORM mode shows typically WORM-like asymmetric performance: SCSI-write times are comparable to a slow magneto-optical drive, while read times run three to four times faster.

Computer Upgrade Corporation markets a Pioneer-based drive—the Omnistor—with improved performance derived from use of a 250K RAM cache. If the manufacturer's performance claims are true, this machine performs faster than any Sony-based erasable optical, yet costs only $4195—a competitive price for a multifunction unit.

By next year, look for faster, cheaper optical drives with WORM capability bundled free.

and the best manual in the business. Does a good manual and a utility that sells for less than $100 make more than $2500 worth of difference?

If you need an erasable optical drive less often—such as for occasional archiving or that once-a-week transfer of data to another user—select from the slower, cheaper Ricoh and Canon drives. Within this range, obey your common sense. Compare the MacProducts USA Magic 600 Optical ISO at $2395 to the Xyxis XY600RW for $4995. The drives post similar benchmarks and MacProducts throws in a load of shareware.

Bear in mind that every few months these companies improve the driver software for their products—usually free to registered users for the first year—so they tend to leapfrog each other in performance. Meanwhile, prices fluctuate constantly. Half the vendors changed prices while I wrote this article. Prepare to shop around.

Looking Ahead

A few magneto-optical drives that have recently hit the market could not be tested in time for this article. These include the MacInstor Erasable Optical 650—a $5495 Sony-based unit from Storage Dimensions—and Sumo Systems' $3500 Ricoh-based Optical Disk Drive Subsystem. TASS International expects to ship 652MB and 1GB models later this year.

Panasonic's all-optical system represents something new on the horizon. In Panasonic's *phase-changing* method, the laser melts and remelts tiny spots, changing the structure of bits on the surface layer from amorphous to crystalline and back to amorphous again; these two states have different reflectivity, which are read as 0's and 1's (see "The All-Optical Approach"). The Panasonic machine also features a WORM function.

Panasonic will not market this drive directly but the company did provide me with a sample unit for evaluation. The driver performed no better than the average for Sony-based units, but phase-change technology presents opportunities for faster drives in the near future. This method uses no electromagnets, whose size inhibits access time. In contrast, lasers are continually getting smaller and more powerful, enabling them to heat up smaller spots faster, increasing data density (Panasonic's cartridges now contain 460MB per side). Laser-technology improvements offer the prospect of smaller, higher-rotation-speed drives in the future.

The drives are now in the hands of companies that will package and sell them. Look for them to enter the market later this year, at prices between $4000 and $5000.

By this time next year competitive markets probably will emerge in 3½-inch, multifunction, and all-optical drives. As these products become standardized, storage decisions will become more complex. But take heart—it will be a complexity born of higher quality, more flexible storage solutions. ◘

See *Where to Buy* for contact information.

Contributing editor ***Charles Seiter*** *has been tracking different types of mass storage for* Macworld *for four years, patiently waiting for exotic technologies to drop in price*

First Steps in the SEQUENCE

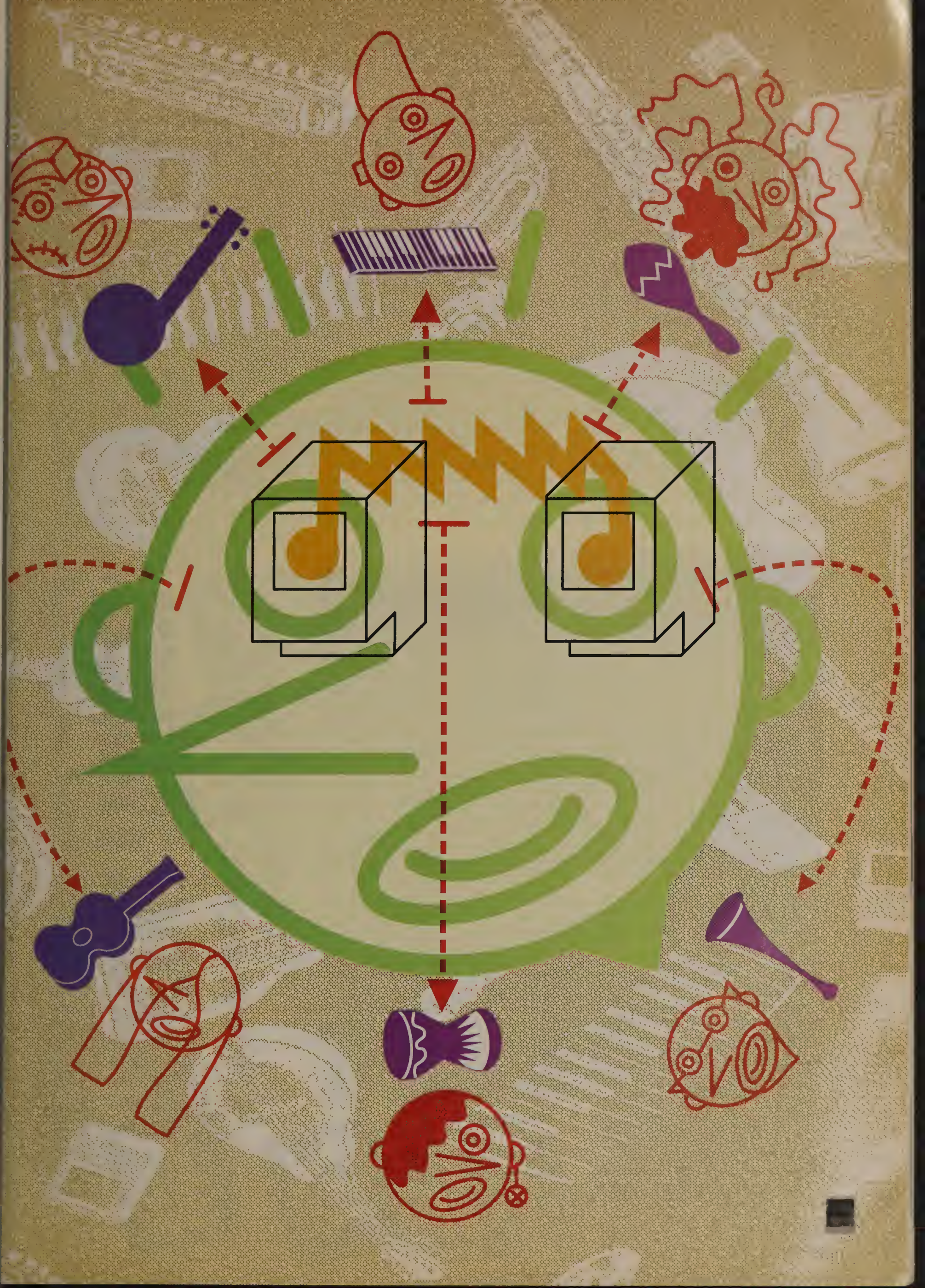
HOW TO GET STARTED IN MAC MIDI MUSIC WITHOUT REALLY TRYING

"Ka-boom TEE radda-radda-ra! And then the brass: *ump-POW! Bop-sha POW!* And then—drum break! *Diddle-iddle-iddle BOP!"*

Morty was mortified. This was his Big Break—his chance to sing his hit-song-to-be for a real record producer, Lefty C. Dee. But Lefty wasn't getting it. He gave Morty a stare blanker than a new sheet of music paper. "Sorry, son," he said. "Your work doesn't fit our needs at this time." Lefty left.

That did it. Morty was tired of expressing the music inside him by trying to sing all the parts at once. He'd seen Macs in recording studios; he'd heard that movie scores, TV jingles, and hit singles were all somehow made on the Mac; and he'd heard fantastic, full-orchestra demo tapes made by friends who swore they'd never left their living rooms. Hey, I've got a Mac, Morty thought—why can't I do that?

by David Pogue



The salesperson at the music store he visited was delighted. "Why, we've got just what you need! We'll set you up with a SMPTE-to-MTC converter, maybe some DSP modules and a 16-bit additive-waveform tone bank—you'll be cookin'!" Morty wondered what any of the salesperson's pitch had to do with music, smiled wanly, and went home. If he was going to learn how the Mac could make music, he'd have to start from the beginning.

Ingredients

What Morty was soon to find out was that high-quality music-making on the Mac isn't really difficult at all. The world of music he was about to enter is known as *MIDI* (pronounced *middy*). It stands for Musical Instrument Digital Interface—computerese for synthesizer hookup. MIDI is something like PostScript, the printer language spoken by the Mac over a cable. But instead of carrying page-description instructions to a printer, MIDI cables convey music-description signals to a synthesizer. One signal says "play middle C"; another says "push the sustain pedal down." The keys and pedals don't actually move, but otherwise the instrument responds by playing exactly as though a human were at the controls.

And because the Mac transmits hundreds of these MIDI signals per second, it can play some very complex music indeed. It can, for example, play the synthesizer's string, woodwind, brass, and percussion sounds simultaneously. Using a technique called *sequencing*, today's composer or orchestrator can teach the Mac each instrument's part separately; then, like a multitrack tape recorder, the Mac plays all the parts back in perfect synchronization.

Unlike a tape recorder, however, the Mac-as-a-sequencer can change the key of a piece instantly without changing the tempo—or vice versa. And the Mac never makes you wait to rewind or fast-forward; you can jump instantly to any spot in the piece. Above all, composing with a sequencer means you can fix wrong notes, add accents or crescendos, and copy and paste parts of a song—all without ever having to rerecord the original performance.

After making a couple of phone calls, Morty realized that he could get started in MIDI, with no previous experience, for under $500. All he needed were the three ingredients of a Macintosh music setup: a synthesizer, a MIDI interface to connect the synthesizer to the Mac, and a sequencing program.

The Keyboard

Suppose you're writing a piece for bass, piano, and flute. Already your piece is too difficult to play by yourself—even if your synthesizer can produce those sounds, you'd need at least three hands. Here's where MIDI comes in handy; the Mac can play all three parts, keeping perfect track of which instrument is supposed to play which notes.

That's most of what you need to know when you sally forth to buy a synthesizer: it must be *MIDI-compatible* and *multitimbral* (can play more than one instrument sound at once). You can tell if a keyboard is MIDI-compatible by checking for the presence of two round, nickel-size MIDI jacks in the back. You can't really tell if the synthesizer is multitimbral by looking; get a salesperson to tell you. The most basic multitimbral MIDI keyboards cost about $150 in music stores; Casio, Yamaha, and Kawai each make several keyboards with street prices in that range.

Of course, what you get for $150 won't sound like the Vienna Philharmonic. These keyboards sound pretty cheap and chirpy. Furthermore, they have miniature plastic keys, about two-thirds the length of real piano keys. And they don't have 88 keys like a piano, either; you usually get four

SEQUENCING PROGRAMS

Product Name	EZ Vision 1.0	Trax 2.0	One-Step 1.0	Deluxe-Recorder 1.0
Company	Opcode Systems	Passport Designs	Freq Sound	Electronic Arts
Price	$149	$99.95	$69	$149.95
Maximum number of MIDI channels	16	32 *	16	32 *
Maximum number of tracks	16	64	16	16
Import and export MIDI files	●	●	●	●
MIDI Manager–compatible	●	●	○	○
Manual offers tutorial/manual offers index	●/●	●/○	●/○	●/●
Dnline help	●	○	○	○
Adjustable countoff click	●	●	○	●
Auto stop/auto rewind	●/○	●/●	○/○	●/●
Gradual tempo changes/graphic tempo editing	●/●	●/○	●/●	●/●
Looping of whole track/looping of part of track	●/○	●/○	● [1]/○	●/●
Metronome via Mac speaker/metronome via MIDI	● [2]/●	●/●	○/●	○/●
Notes displayed in color	●	○	●	○
Dn-screen volume sliders/recordable movements	●/●	●/○	○/○	○/○
Dut-of-tempo recording (add barlines after)	○	○	○	●
Play, stop, rewind from Mac keyboard	P, S	P, S, R	P, S, R	P, S, R
Select synthesizer sound by name	●	●	○	●
Step recording (one note at a time)	●	●	●	●
Number of steps required to insert copied material	1	3	2	3
Tab stops demarcate song sections	○	●	○	○
Track names visible while working	○	●	○	●
View and edit several tracks at once	●	● [3]	●	○
Visual editing of controller info	●	○	●	●

● = yes; ○ = no.

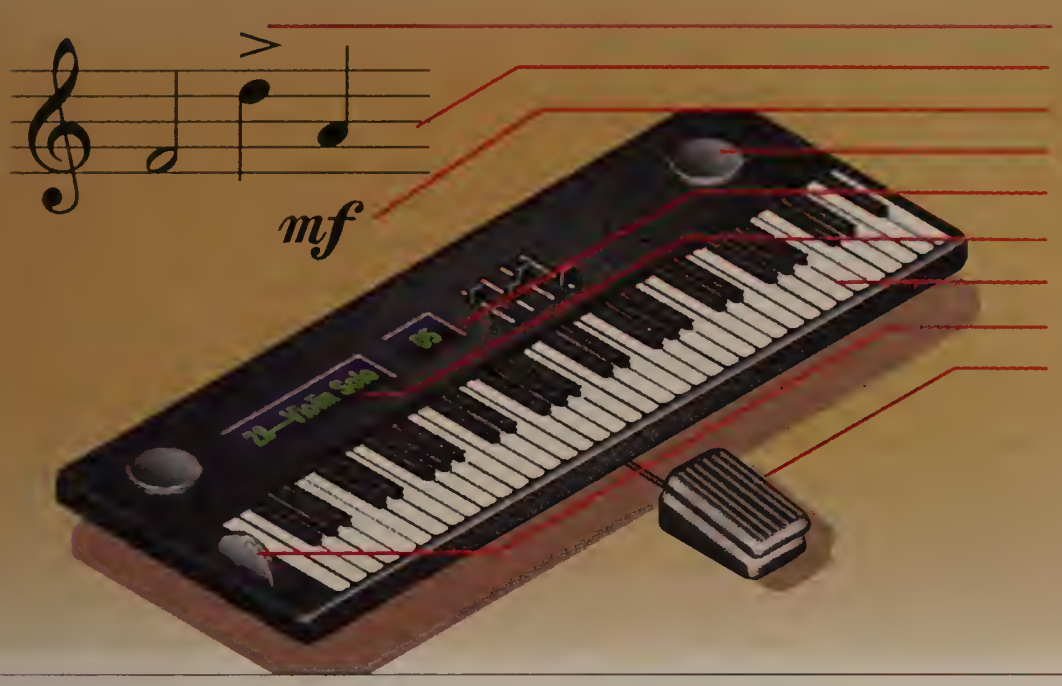
** To get 32 channels you need two MIDI interfaces (one for the modem port and one for the printer port) or a MIDI interface designed to plug into modem and printer ports simultaneously.*

[1] Infinite looping only.

[2] Except Mac Classic.

[3] Cut, copy, and paste only in Song Editor, not in Step Editor.

MIDI to the Macs



Key velocity (how hard key is struck)
MIDI note number (pitch)
MIDI volume (overall volume)
Pan (left-to-right stereo position)
MIDI channel (1 to 16)
Patch number (instrument sound)
Aftertouch (pressure on key while it's held down)
Pitch bend wheel (and modulation wheel)
Pedaling

A MIDI instrument is capable of sending hundreds of messages per second to a sequencer over MIDI cables. This diagram shows a few of the musical-description codes a sequencer can record and play back.

or five octaves instead of seven. Therefore, you may want to consider a keyboard with full-size keys or another octave's worth of them; count on paying another $100 more for each of these features. If you're going to get a little more serious, and want to create more professional-sounding recordings, you might consider paying several hundred dollars more for *touch-sensitive* keys, so that the harder you strike a key, the louder the note sounds (as on a real piano).

Finally, find out how many notes the synthesizer can produce simultaneously. A *12-note polyphonic* keyboard, for example, can just handle an arrangement for bass, drums, piano, and strings, provided no more than 12 notes are sounding at any one moment.

Morty ended up selecting the Yamaha PSS-795 for about $300. It has smallish keys and it's not touch sensitive, but it is 28-note polyphonic and it has built-in stereo speakers, excellent drum sounds, and strong MIDI features.

The Interface

Trudging home with his new synthesizer, Morty looked forward to the simplicity of the next item: a MIDI interface. A MIDI interface is the communications link between the Mac and a MIDI keyboard; the interface needs no power cord, no on/off switch, no glowing lamps. You plug one end in the modem port of the Macintosh; the other end attaches to the MIDI cables from the synthesizer. There are two cables, labeled IN and OUT, because MIDI signals only run one way in each cable.

The Apple MIDI Interface is the simplest. For $99, you get a Mac-color plastic box about the size of a bar of Ivory soap. It works just fine, but it's a poor value for two reasons. First, it's relatively overpriced. Second, it's a *one-in, one-out* interface—it only has a port for one synthesizer. If you ever buy a second keyboard, you'll have to buy another interface. Most other interfaces offer at least three outputs, so the Mac can play three keyboards simultaneously with only one interface. Passport Designs, too, makes a single-output interface—but at $130, it's even less economical.



LUIS DELGADO

Hey Mr. Tambourine Man Tim Self uses Opcode's EZ Vision, both a Roland W-30 and a Roland U220 synthesizer, a Yamaha monitor speaker, and Opcode's Professional Plus MIDI interface with a Mac SE in his home studio.

MacNexus Interface, the sturdy, black steel interface from J.L. Cooper Electronics, has three outputs; it's rugged and heavy, and only costs $69.95. For ten dollars less, there's also the Mac-color, plastic, three-output MIDI Translator from Opcode.

Morty, however, discovered the least expensive (and least cluttery) interface on the market: the Altech MidiFace LC. This $49.95 interface isn't even a box; in fact, it looks more like a plastic hot dog. The cable to the Mac is built into the interface

(unlike any of the others, which require a separate cable), and there are three outputs. It's warrantied for a year, works like a charm, and saved Morty money.

The Sequencer

There was only one more thing Morty needed: a sequencing program. In some ways, a sequencer is unique in Mac software; there's no Print command. You can't paste anything from it into PageMaker. To run it, you hardly use the Mac keyboard at all. But a good sequencer can turn you into an orchestra.

All sequencers are fundamentally alike: in one window there are *transport controls,* on-screen buttons labeled Play, Stop, Rewind, Record, and so on. You click on Record and play the synthesizer. When you click on Stop, every note you played appears as a strip on a horizontal bar graph. As with a tape recorder, you hit Rewind and then Play; the sequencer dutifully plays the synthesizer, re-creating your performance to the subtlest nuance. It's amazing how much musical feeling a sequencer can capture—especially when you realize that its idea of "feeling" is simply a stream of numbers about each note you played.

Morty soon discovered four sequencers costing under $150: Trax, One-Step, DeluxeRecorder, and EZ Vision (see "Sequencing Programs"). Each is marketed as an entry-level sequencer. Morty hoped that meant easy to use.

Making Trax

Trax, from Passport Designs, is a good example of a good sequencer (see "Trax to the Max"). Its manual starts at the beginning, even guiding you in the not-necessarily-intuitive act of connecting MIDI cables. And, as sequencers go, Trax is very easy to understand.

You begin by creating a list of independent musical parts, or *tracks,* that you plan to include in your piece. For example, your track list might include strings, piano, bass, and drums. Next to each track name, you enter its *MIDI channel* number (1 to 16). That's the Mac's big secret to playing many interweaving musical lines without forgetting which notes are piano and which are strings, by the way. You tell the Mac to broadcast the piano's notes on Channel 3, and you tell the synthesizer to play all Channel 3 notes using the piano sound. (It's not nearly as complicated as it sounds.)

Morty first got to play with Trax at a demonstration at his Macintosh user group. He soon got used to pressing the Space bar to start and stop playback—a shortcut for clicking the on-screen buttons. He liked the way Trax automatically stopped and rewound the sequence when he finished recording each part. He also loved seeing an overview of his entire piece. Trax represents each measure by a small black square (there is music in the measure) or by a hollow square (there isn't any). At a glance, you can see 32 measures or more, and you can cut, copy, or paste them instantaneously—no small consideration in a field as repetition-intensive as music.

After recording his steamin' piano part, Morty decided to get really creative and orchestrate. He named the second track Bass Line, assigned it to MIDI Channel 5, checked that the synthesizer's Channel 5 was set to its Funky Bass sound, and recorded the bass line while listening to his piano part play back. It was all too easy! Now he set the third track to be the drum part, on Channel 6. Finally, he sat back and listened to the piece. It was fine, but he noticed that his playing wasn't utterly accurate—every now and then the bass and the drums wouldn't land quite together.

Quantize Leaps

That's how Morty learned about *quantization*—that magical clean-up-my-sloppiness command found only in music programs. The Quantize command shifts the recorded notes in time so that each one falls neatly on the beat, or on whatever subdivision of a beat you specify. When Morty played his piece after quantizing, he certainly got what he asked for—but the piece sounded as if it had been played by a rhythmically perfect robot. He used the Undo command. (He was lucky this time. Trax's Undo command doesn't work with some operations.)

He tried the Quantize command again. This time, however, instead of sliding each sloppy note precisely to the beat, he used the Sensitivity setting in Trax to pull each note most of the way to the beat, maintaining some of the human touch. This time the playback sounded great.

The Next Step

The next sequencer Morty tried was a bizarre program called One-Step. Originally bundled with a long-discontinued MIDI interface by a now-defunct company, One-Step was rescued from obscurity by one of its fans. This fellow wrote a manual (something One-Step never had), made himself available for friendly, smart phone help, and began to market it. At a mere $69, One-Step immediately had Morty's attention.

Morty discovered some strange and wonderful things about One-Step. On a color monitor, the notes of each track appear in a different color. Furthermore, loud notes appear in darker shades than soft ones—a unique and useful feature. A Move dialog box can



LUIS DELGADO

The AMA—All MIDI Apartment Mike Higgins uses Passport's Trax sequencer, a Mac II, a Roland D 10 synthesizer, and various drum machines, analog devices, and keyboards in his San Francisco apartment.

instantly shift a selected chunk of music either forward or backward (in time), up or down (transposing), or both at once. And where Trax offers two or three useful quantizing options (such as Sensitivity), One-Step's Quantize dialog box is full of them: Delay, Tighten, Partial, and more.

There are some sophisticated features in One-Step, too, that made Morty realize what Trax lacked. For example, One-Step lets you view all kinds of *controller* information—non-note data such as pedaling, pitch bends, tempo changes—on a graph. You can actually edit the curved graph of a pitch bend or redraw pedaling patterns.

But Morty noticed something odd. One-Step's tracks are numbered from 1 to 16, and there's no way to label them; you have to memorize that Track 8 is harp, Track 11 is banjo, and so on. One-Step provides a "metronome" by playing a note on the keyboard; Morty missed the Mac speaker click provided by other sequencers. Morty grew annoyed when he found that the watch cursor made a ten-second appearance after recording each track. And because One-Step is a four-year-old program, it already lacks features that are standard on recent sequencers: *looping,* or specifying that a passage repeat a certain number of times; access to 16 additional MIDI channels by attaching a second MIDI interface; and compatibility with Apple's MIDI Manager software (see "MIDI Manager"). And One-Step's manual includes a whopping three-page list of bugs. Morty certainly appreciated the honesty, but wasn't reassured much about getting past Step One.

MIDI MANAGER

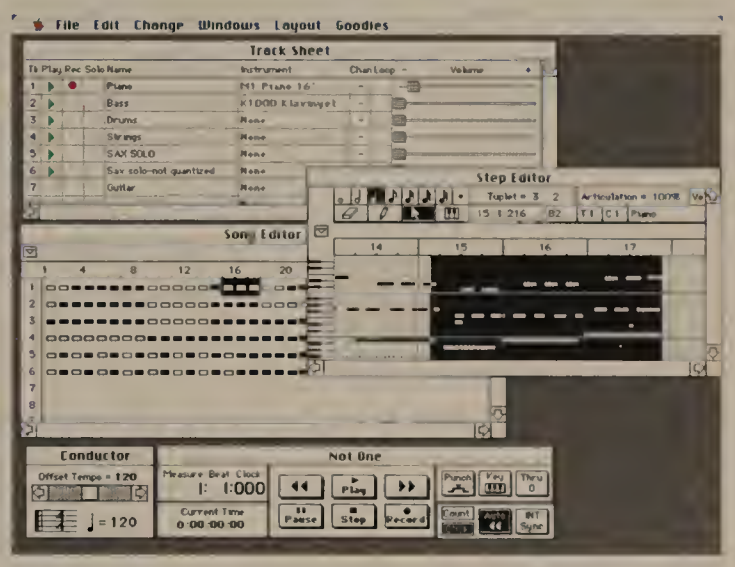
The MIDI Manager is a special new piece of software from Apple, available from Apple dealers or music stores. The story goes like this: MIDI programmers were continually having to rewrite their programs to accommodate the slightly changed electronics of each new Mac model. Finally Apple created MIDI Manager to provide a common platform for all current and future Macintosh models. The idea is that if a sequencer works with MIDI Manager now, it will also work with any future Mac. Some current sequencers, like Green Oak Software's Rhapsody, don't run at all without MIDI Manager.

MIDI Manager lets you do some tricks you never could do before. For example, under MultiFinder you can run more than one MIDI program simultaneously, so—in theory—EZ Vision could record what Trax is playing.

MIDI Manager will become more important as software developers take advantage of it. To really use it, your Mac should have enough memory to run MultiFinder, and the MIDI programs you use must support MIDI Manager (One-Step and DeluxeRecorder don't). A stable version of MIDI Manager helps too: the current, 2.0, works much better than previous versions.

Deluxe Music-Making

Morty fell in love with DeluxeRecorder at a Macintosh show. "Now *that's* a sequencer," he thought. DeluxeRecorder displays the bars-representing-notes on a musical staff, making their pitches much easier to identify. The program makes brilliant use of the Mac keyboard. You don't even need the ⌘ key; you can just press Q alone to quantize, I or O to zoom in or out, and so on. And Morty was thrilled with DeluxeRecorder's unique, most remarkable feature: the program secretly records anything you play while your previously recorded music is playing back, even when you haven't clicked on the Record button. If you happen to play a lick you like, you can tell DeluxeRecorder to store it in a track, just as though you'd deliberately recorded it—a safety net in case you get brilliant.



Trax to the Max The structure and relationship of Trax's main windows make the program especially easy to understand. The Track Sheet window displays your 16 tracks (and the synthesizer sounds they've been assigned to); the Song Editor is an overview of the piece; the transport controls appear in a floating window (bottom). If you double-click on any black square (full measure) in the Song Editor, the Step Editor appears (right), where you can edit notes one at a time.

Like One-Step, DeluxeRecorder lets you edit pedaling, pitch bends, and tempos graphically; but in DeluxeRecorder, you can do all of this and still see the notes in the same window. And there's a feature that lets you record freely, without playing to a metronome click (as you must in other low-cost sequencers). Afterward, you can tap in the beats and barlines as the music plays back—a feature only found in sequencers costing four times as much. Morty loved it.

His credit card was halfway out of his wallet when it happened. Morty had just listened to a piece and clicked on Stop, but one nagging note kept playing. He clicked on Stop several times more; he pressed the offending key on the synthesizer. Finally, he turned the synthesizer off. Only then was the note silenced. Morty's first encounter with DeluxeRecorder's unfortunate bugs led him to discover that the program lacks an All Notes Off command (which most

NEXT STEPS IN THE SEQUENCE

Like anything high-tech, there's always a MIDI product that's better, more powerful, and more expensive. You can see such items at a music store, but here's what you can look forward to.

Keyboards There are essentially two kinds of MIDI keyboards: *synthesizers* and *samplers*. Synthesizers, like the famous (but non-multitimbral) Yamaha DX-7 or most Casio keyboards, generate sounds electronically. They're great for making spacey, unusual sounds—but their imitations of acoustic instruments usually aren't convincing. Samplers, on the other hand, use digital, compact disc (CD) technology; you press a key, and the machine plays back a short actual recording of the real Vienna Philharmonic string section. As a result, samplers can sound fantastically realistic. They can also be fantastically expensive—the best, like the Roland S-770 Digital Sampler, cost around $7000.

But there are also some hybrid synthesizers-samplers that sound great and don't cost a fortune. The Korg M1 Music Workstation, the Yamaha SY77, and the Kurzweil 1000 series play back sounds that began life as samples but are stored on a chip in the machine. (Thus you avoid the tedious disk-swapping required by full-fledged samplers.) At around $2000, these machines sound terrific—nowadays you hear them in many pop recordings, TV jingles, and film scores. They have touch-sensitive, full-size keys, too.

Interfaces Beyond the $50 basic interfaces there's a host of more-complicated devices. Altech sells the $79.95 MidiFace EX, a compact interface with an A/B switch—which lets you avoid unplugging the modem every time you want to use the synthesizer. Because the MIDI system and modem must share the same Mac port, an A/B switch is an essential feature if you own a modem.

Another group of interfaces, such as Opcode Systems' Studio Plus Two ($199), plug into the printer and modem ports simultaneously. That lets the Mac record from two keyboards at once—and gives you twice the number of available MIDI channels (16 from each port). Not all sequencers handle multiple-track recording, though, so inquire before you buy.

Some interfaces have two features coveted in professional circles: *time-code* support, and support for a profusion of additional MIDI channels. Time code is a system that synchronizes a sequencer with a multitrack tape recorder. Rewind the tape, and the sequencer rewinds to the same spot. Additional-MIDI channel interfaces, like the MIDI Time Piece from Mark of the Unicorn ($495), use sophisticated circuitry to provide you with 128 MIDI channels—a must for the true MIDI-head whose sequences include dozens of tracks and a whole rack of synthesizers.

Sequencers There are high-end sequencing programs that have some amazing features. Green Oak Software's Rhapsody ($225), Opcode's Vision ($495), Mark of the Unicorn's Performer ($495), Passport Designs' Pro 4 ($495), and Beyond from Dr. T's Music Software ($319) are some examples. Most of them offer an unlimited number of tracks, support for professional time-code systems like SMPTE (Society of Motion Picture and Television Engineers), multiple-track recording, powerful looping features, and a dazzling array of editing commands. And every one supports Apple's MIDI Manager.

Each high-end sequencer has unique features too. Performer can display what you've recorded in standard music notation, complete with beams and stems. (It's a bit crude—you could never read it like sheet music—but it's more intuitive than editing bar graphs. If this feature intrigues you, watch for Mac Ballade from Dynaware USA, a new sequencer that lets you view and edit notes *only* in notation form.)

Vision not only shares many of EZ Vision's smooth, clever interface features (one example is the remarkable "scrubbing" feature that lets you hear any music you drag the cursor over, backward or forward), but also offers 99 tracks per sequence instead of 16. Vision can even compose its own improvisations. Rhapsody, with the lowest cost-per-feature ratio of any sequencer, feels a little bit home-grown but has a unique system of cloning musical sections; each copy is linked to the original, so that when you edit the original, the copies are automatically updated.

Pro 4 is as simple to use as Trax (its sibling), but includes graphic controller editing, SMPTE time-code support, and an overdub recording mode. And Beyond 2.0, written by Jeremy Sagan (Carl's son), has a delightful multiple-takes recording feature: it keeps repeating what you've already recorded, while you play one version after another of a new musical line. The program records each of your attempts in a separate track; you can later choose which one you want to keep, or combine pieces of each. Dr. T's also sells Beyond 1.6 with MIDI interface (Altech) and a stripped-down version of Great Wave Software's ConcertWare+MIDI notation program in a $399 bundle.

Out of Sequence Once you know how to sequence, the world of multimedia awaits. You can incorporate your finished sequences into HyperCard stacks using Opcode's MIDIplay or Passport's HyperMusic. Just click on a button to play your sequence. You can export sequences as *MIDI files,* the common interchange format of all music programs, to music notation programs like Passport Design's Encore, or Coda Music Software's MusicProse or Finale, for editing and printing. There are MIDI-controlled mixers, lighting boards, and other devices, too; if you really want to, you can create sequences that play lights and fog machines with the music.

And if you're not quite that ambitious, you might just listen to some ready-made MIDI sequences of popular songs. MIDIclips from Opcode and MIDI Hits from Music Data, a division of Passport Designs, are MIDI files that any sequencer can play. Just pop them in, assign the tracks to the appropriate sounds on your synthesizer, and listen.

ONE-INPUT MIDI INTERFACES

Company	Altech Systems	Altech Systems	Apple Computer	J.L. Cooper Electronics	Opcode Systems	Passport Designs
Model	MidiFace EX	MidiFace LC	Apple MIDI Interface	MacNexus Interface	MIDI Translator	MIDI Interface
Price	$79.95	$49.95	$99	$69.95	$59	$129.95
Outputs	3 *	3	1	3	3	3
Includes cables	○	○	●	○	○	○

*●=yes; ○=no. * Has A/B switch for modem.*

other sequencers have). As time went on, he noticed other problems. The program doesn't import or export files properly, doesn't work at all with the MIDI Manager, and occasionally crashes mysteriously. Worse, a call to the program's marketer, Electronic Arts, revealed that no fixes or enhancements are planned for Deluxe-Recorder. Version 1.0 it is, and version 1.0 it ever shall be.

Never was there a program so cleverly designed, with such easy-to-access power. It broke Morty's heart that the program would always remain in its not-quite-finished state.

EZ Enough

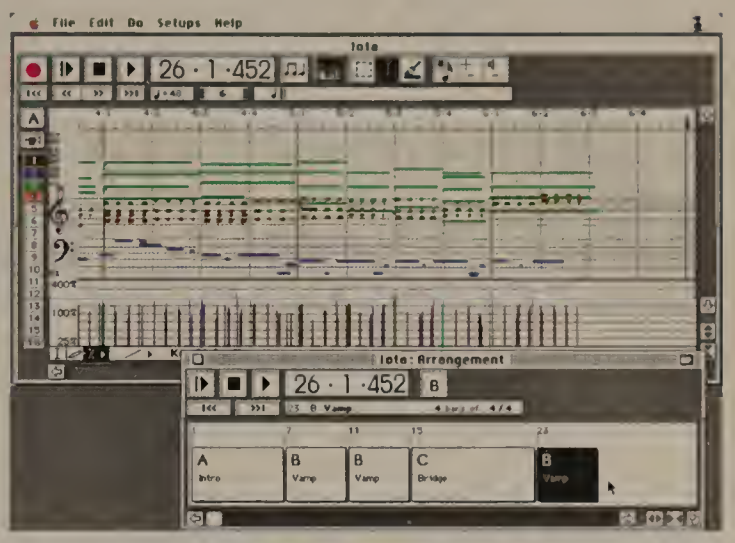
About a week later, Morty was back in the music store, this time to watch a demonstration of the newest inexpensive sequencer: EZ Vision, a more cleanly designed, easier to use version of the professional Vision program.

Right away Morty noticed three things he didn't like. First, like One-Step, EZ Vision doesn't allow you to see names (Zither, Accordion, Drums) in the track list—only track numbers. Second, there is no Macintosh keyboard equivalent for the Rewind command; you have to use the mouse every time. Finally, there's no Sensitivity setting for the Quantize command. EZ Vision snaps every selected note precisely to the beat, taking all the humanity out of the original performance.

But thereafter, all of EZ Vision's surprises were pleasant ones. Morty found the animated ball that bounces from beat to beat cute—then he realized that it actually was a superb visual metronome when he was recording. Seeing each track's notes in a different color makes editing a delight. And a small but glorious feature won him over. Where some sequencers let you specify the number of metronome clicks you want as a *countoff* before you record, EZ Vision lets you wait as long as you want before you start playing. In the meantime, it clicks endlessly, in a suspended state, and only begins recording when you play the first note. Morty found that this system gave him all the time he needed to get inspired (see "Music to Your Eyes").

Furthermore, each EZ Vision file is really 25 open files at once. Each of those files, labeled A to Y, can be a separate song or section of a song. Then, in the Arrangement window, you can drag the files into any order you want. Morty recorded a verse of a song and called it A; he recorded the chorus, and called it B. Finally, he dragged these two blocks around in the Arrangement window, trying an ABAB version, then an AAB version, and so on.

EZ Vision, too, lets you easily edit all kinds of controller information. And like Passport's sequencer, EZ Vision generally runs quickly and smoothly. Both Trax and EZ Vision are terrific, solid, easy-to-use sequencers; Trax is simpler, but EZ Vision has more features and flexibility—a first-timer's program that's tough to outgrow. Morty hoped he'd be working with MIDI for a long time, so he equipped himself with EZ Vision, the Altech interface, and the best synthesizer he could afford—the rudiments of a real home music studio.



Music to Your Eyes In this unusually complex snapshot of EZ Vision, you can see notes displayed in bar graph form (one color per track). Below the note display, there's a strip chart where you can graphically edit any non-note MIDI information: pedaling, pitch bends, volume, and so on. In this example, which was generated using a touch-sensitive keyboard, the vertical bars represent key velocity (how hard each note was struck). At the bottom of the screen is the Arrangement window, where you can rearrange various sections of the song.

Right to Lefty

A month later, Morty sat proudly in Lefty C. Dee's office as they listened to Morty's home-produced demo tape. It sounded sensational—crisp, multitimbral, and wrong note–free. "Mmm. Terrific tune," Lefty said. He slid a recording contract across the table. "There's only one thing I'd change," Lefty said. "Oh?" said Morty, busy signing papers. Lefty perked up. "I'd throw a screaming guitar solo in the middle. You know, like—*da dit DWEEEEE, dwee bubba bubba, skrawwwwng* . . . and then the bass could come in—*ka-toom toom toomba!* And then—*drum break!*" ◘

See *Where to Buy* for contact information.

***David Pogue**, a* Macworld *contributing editor, is a composer and conductor in New York. He's obsessed by the fact that* midi *means* "noon" *in French*

Are today's hand-held scanners more than a cheap novelty?

One in the HAND

Rudimentary novelty items only a year ago, hand-held scanners today are much more effective tools for collecting and manipulating images from the world around you. With color- and gray-scale–detection capabilities built into the hardware of some new models, and with major software improvements being nearly universal, hand-held scanners now rival the technological sophistication of their full-page desktop cousins, the flatbed and sheetfed scanners. Yet despite their new talents, these little digitizers retain some inherent weaknesses that limit their usefulness. For the budget-conscious image collector, a hand-held scanner can be a smart buy—but only when the tool fits the job at hand. To help you decide whether a hand-held scanner is right for you—and choose the right model—I've surveyed the current crop. The list includes five black-and-white-only models (the Lightning-Scan 400, The Complete PC's The Half-Page Scanner/400, Logitech's ScanMan Model 32, the Marstek's M-800 Mac 64, and Caere Corporation's Typist), one with true gray-scale capabilities

BY STEVE CUMMINGS


LightningScan™



Logitech's ScanMan Model 32, Marstek's M-800 Mac 64, and The Complete HalfPage Scanner/400 (clockwise from upper left)

(Asuka's NuScan Gray), and two color scanners (Asuka's NuScan Color and Sharp's JX-100M).

The Limits of Hand-Helds

By virtue of their small size and the absence of many moving parts, hand-held scanners cost a lot less than full-page desktop scanners. Although that's not the hand scanners' sole advantage, economic necessity is probably the primary reason to seriously consider a hand-held model. True, hand-held scanners conserve desk space, are portable, and can grab images from large or oddly shaped items that can't be put on a flatbed, such as some bound books or, say, your wallpaper. But they also have two serious disadvantages that make them much harder to work with than a desktop scanner: limited scan width, and image distortion introduced by the manual scanning process.

Hand-held scanners can capture in one pass a swath no wider than about 4 inches, narrower than most everyday images. Theoretically, you can scan an image in two or more parallel strips and then reconstruct the original by piecing the strips together using the scanner's software. Unfortunately, the software provided with most currently shipping hand-held scanners lets you down in this area.

Image distortion is the other big problem with scanning by hand. No matter how steady your grasp, it's impossible to roll a scanner at a constant speed. Most hand-held scanners contain electronic "speedometers" that try to adjust the resulting image accordingly, but you'll still notice stretched or squished areas in the scan if you accelerate or decelerate suddenly. Likewise, if you make any deviations from a perfectly straight path they will show up as electronic wrinkles in the scan. Some scanner models include guides on the housing or extra wheels on the bottom to prevent deviations, but you've got to concentrate to make sure the scanner presses up against the guide at all times (better still are Intra-Cut Machining's Accu-Scan and American Business Concepts' Scan:Align, third-party contraptions that keep the scanner on a straight path).

With practice, you learn how to avoid obvious distortion in scanning a single strip. But try stitching together two separate strips of any length—you typically find that subtle image deformities make it impossible to align the strips precisely.

Then Why Buy One?

Given these caveats, why consider a hand-held scanner at all? Price and size may be two reasons. And, despite their limitations, hand-held models produce high-quality scans and can be genuinely useful in certain situations.

All of the black-and-white units do a superb job of reproducing line art (drawings containing only black lines and white space, with no colors or intermediate shades of gray). The gray-scale and color models capably handle photographs and colored or shaded art, producing screen images that look great in image databases or video presentations. (But unless you have access to a professional-quality imagesetter or a color printer that can print grays, you won't see any gradations when you print; the LaserWriter converts the grays back to one of 16 halftone patterns—a far cry from 256 shades.) Finally, since most magazines and many books are laid out in columns, a 4-inch scan width is often enough to capture complete lines of text for conversion into editable form with optical character recognition (OCR) software.

How to Choose a Hand-Held Scanner

Once you decide that a hand-held scanner makes sense for you, you should look carefully at the hardware and the software of competing models before buying a scanner. In the hardware realm, you first need to decide which of the three kinds of scanners you need—black-and-white, gray-scale, or color. If your application requires color, the choice is obvious, but things are not so black and white if you need to capture gray-scale images.

Four of the black-and-white models (all but the Typist, which is designed principally for text scanning [see *Reviews*, *Macworld*, February 1991]) can generate true gray scales from their two-tone scans, managing the trick with some software chicanery called interpolation. The images you get on screen (if you have a gray-scale or color monitor) look startlingly accurate, but don't expect an exact replica of what you scanned. Interpolation converts each pixel's matrix of black dots and white dots into a single pixel of gray. As a result, it lowers the effective resolution to one-sixth of the 400 dots per inch originally recorded, or about 67 dpi, and printouts suffer as a result. In addition, you can't expect extremely accurate gray-shade recognition with this guesswork technique. While The Complete HalfPage Scanner/400 attempts to distinguish 256 separate gray shades, it misses the mark frequently; the ScanMan and the LightningScan are content to accurately distinguish 32 different shades.



More Captured Colors The Sharp JX-100M offers dramatic improvements in the range of captured colors (262,144 colors) and maximum resolution (200 dpi) compared to the NuScan Color's 4096 colors and 90 dpi. But don't think you'll always be able to take advantage of these improvements; on a Mac II with 8MB of RAM, I was able to scan this snapshot-size 24-bit image only at 100 dpi, due to memory limitations.

READING IT IN

You're sitting in front of the Mac surrounded by piles of reference documents, at work on a business report or a research project. Finding just the reference you need, you reach over to your hand-held scanner, fire up its software, and scan the relevant paragraphs. A few moments later the text appears in your document, courtesy of the software's optical character recognition (OCR) talents.

Caere Corporation's Typist scanner package, which combines a conventional black-and-white hand-held model and an OCR-capable desk accessory, makes real this wordsmith's fantasy. You can activate the DA from within any word processor, page-layout package, or spreadsheet. After you've drawn the scanner across the printed page, the Typist converts the scanned image to ASCII characters, returns to the original application, and dumps in the text beginning at the previous cursor position.

The Typist's software does an excellent job of correctly interpreting most fonts. What's more, it makes special provisions for circumventing the particular limitations of hand-held scanners. Scan a vertical column of text, and the Typist ignores text in adjacent columns. Scan in two or more overlapping horizontal swaths, and the Typist deletes duplicate characters in the overlapped areas. Of course, neither the software nor the human operator are perfect, and you can still expect some errors, particularly when scanning near the curved center of a bound book or when you are scanning ornate text styles (see *Reviews, Macworld,* February 1991).

Unlike other hand-held scanner products, the Typist isn't targeted at a budget-minded audience. At a minimum, you need a Macintosh SE, at least 4MB of RAM, and 2MB of empty hard disk space. In addition, you must run the Typist DA under MultiFinder.

Actually, any black-and-white hand-held scanner will function adequately for OCR work, as long as you buy the right software to go with it. By the time you read this, ReadRight for Macintosh, an OCR software package designed to work with both hand-held and desktop scanners, should be available.

Without a fluid way to transfer text between the printed page and a document, however, it makes a lot more sense to use a full-page scanner to capture large amounts of text in each scanning session. Not so with the Typist, which is practical as an as-you-go secretarial substitute.

Asuka's NuScan Gray, in contrast, can detect 256 shades directly from the original image, without software assistance, and with considerably better accuracy than the black-and-white units provide. However, even the NuScan doesn't always differentiate accurately between very similar shades. Still, if your application calls for the highest possible quality gray-scale pictures, the NuScan is your only choice among the units reviewed—and you can skip the rest of the decision tree (for more on gray-scale scanning, see "Grade-A Gray Scale," *Macworld,* October 1990).

Cutting a Narrow Swath

In choosing a hand-held scanner, several other basic hardware issues should concern you. One is scan width. Clearly, the larger the scanning window, the less you have to worry about clipping or joining separately scanned strips. The scanning windows of all the black-and-white units surveyed here measure about 4 inches, except for the 5-inch window on the Typist. On the other hand, there's a big difference between the two color units: 3.9 inches for the Sharp versus only about 2.5 inches for the NuScan Color. Software solutions to the problem of narrow scan strips are critical, but only the LightningScan's and the ScanMan's software utilities currently offer viable answers (see "Knitting Images Together" and "Stitching the Scan Together").

Look also for aids to steady, straight scanner runs. Most of these scanners flash warning lights when you drag the unit faster than it can accept data. The LightningScan and the ScanMan cases both provide flat surfaces that you can press against a straightedge, helping you to stay on the straight and narrow. Of the two designs, the LightningScan's works more reliably because it offers two flat-surface guides. Those scanners with three rollers on the bottom, The Complete Half-Page Scanner/400 and the Typist, tend to stay on track naturally, but you don't get the positive, if more cumbersome, control the case guides provide.

Resolving Differences

A scanner's resolution determines its ability to pick out detail in the original image. All of the noncolor units compared here offer a top resolution of 400 dpi (in fact, two manufacturers, Omron and Mitsumi, make the light-sensing scan heads used in five of the scanners). Although the Marstek M-800 Mac 64 claims a resolution of 800 dpi, this figure really represents a kind of interpolation—the M-800's software generates extra dots that the unit didn't actually detect, artificially smoothing out the jaggies to a degree. This simulated 800-dpi output is best used for scaling a scanned image to a larger size.

For gray-scale images created with the black-and-white units, it's best to use the highest possible resolution settings, so that the resultant scanned image contains as much information as possible. Remember that this image file will be only one-sixth of its original size after the raw black-and-white scanning information is interpolated into grays.

The Sharp JX-100 and the Asuka NuScan Color



HAND-HELD SCANNER OVERVIEW

Company	Asuka NuScan Color Asuka Technologies	Asuka NuScan Gray Asuka Technologies	LightningScan 400 Thunderware	M-800 Mac 64 Marstek	ScanMan Model 32 Logitech	Sharp JX-100M Sharp Electronics Corporation
Price	NuBus $649; SCSI $799	NuBus $499; SCSI $599	$495	$549	$499	$995
HARDWARE						
Gray shades/colors	4096	256	2	2	2	262,144
Color support	●	○	○	○	○	●
Maximum resolution (in dpi)	90	400	400	800	400	200
Maximum scan width (in inches)	2.5	4.2	4.2	4.13	4.2	3.9
Speed indicator	○	○	●	●	●	○
Interface type	SCSI, NuBus	SCSI, NuBus	SCSI	SCSI	SCSI	Serial
External termination	○	○	●	○	○	○
Minimum system requirements	SE, 1MB	SE, 1MB	Mac Plus, 1MB	Mac Plus, 1MB	Mac Plus, 1MB	Mac II, 4MB, 32-bit QuickDraw
Scan-head manufacturer	Mitsumi	Mitsumi	Omron	Marstek	Omron	Sharp
SOFTWARE						
Scan controls						
Maximum scan length (in inches)	5	limited only by RAM	limited only by RAM	limited only by RAM	limited only by RAM	6.4
Interrupted scanning	○	○	○	○	●	○
Horizontal scanning	○	○	○	○	●	○
DA version included	○	○	●	○	●	○
Editing						
Cut/copy/paste selected area	●	●	●	●	●	○
Rotate selected area	●	●	●	●	●	○
Lasso (freehand selections)	●	●	●	●	○	○
Join adjacent scan strips	yes (max. width 7.1)	through Clipboard	●	●	●	○
Pixel editing (brush and/or pencil)	○	○	●	●	●	○
Gray-scale features						
Gray shades/colors	256	256	32	64	32	262,144
Nonlinear correction	●	●	●	●	○	prior to scanning only
Filters and effects	4	4	13	23	0	0
Dither patterns	6	6	3	0*	3	1
File formats	MacPaint, PICT, TIFF	MacPaint, PICT, TIFF	MacPaint, PICT, TIFF	EPS, MacPaint, PICT, PS, TIFF	MacPaint, PICT, TIFF	PICT2

● = yes; ○ = no. *Instead of dither patterns, Digital Darkroom offers continuous control of screen frequency and angle.

For true gray-scale and color scans, however, you should use the lowest possible resolution setting if you intend to output to a low-resolution device like a LaserWriter or a desktop color printer. When this is done, your disk files will be much smaller, and there will be no appreciable difference in image quality. The two color models reviewed here offer considerably lower maximum resolutions than their black-and-white and gray-scale counterparts: 200 dpi for the JX-100M, and a mere 90 dpi for the NuScan Color.

Color Hardware: Big Differences

A lot more than scan width and resolution separates the two color hand-held scanners. Asuka's NuScan Color, which looks and feels like the other units, creates good-looking 256-color screens. In contrast, Sharp's JX-100M is essentially a downsized flatbed scanner. You position its rectangular image window over the picture you want to scan, and a motor inside the unit moves the scanning element across the image. The scan head makes three separate passes, one each for the red, green, and blue shades. With up to 262,144 hues, the final image looks vividly lifelike, but there's a big catch: generating the image takes much too long. With the three-pass scanning process, a lengthy calibration routine, and data transfer via the Mac's relatively slow serial port, capturing an image with the JX-100M can take 10 minutes or longer, compared to about 30 seconds when using the Asuka.

Software Matters Most

Although most marketing materials focus on the scanner hardware, the software that comes with the scanner is at least as important in efficiently producing quality scans. It's easier to get a handle on software comparisons if you divide them into three main categories: scanning controls, editing features, and facilities for transferring images to other applications.

Controlling the Scan In addition to recording the image, the fundamental duty of a hand-scanner's software is to let the user control the scanning process: turning the scanner on and off, setting how large an area to scan, and so on. The ScanMan's software takes top honors in this category. While other programs can rotate a scanned image, the ScanMan utility lets you set the scan direction (vertical, right to left, or left to right) before scanning, so the image is recorded in the correct orientation. This lets you get around the narrow scan-width limitation somewhat; a wide image, for instance, can be scanned horizontally in three passes, rather than vertically in six or seven. Like other programs, the ScanMan utility stops scanning automatically, but it also lets you stop and restart the scanner manually during a single scan. This way, you can include separate

The Complete Half-Page Scanner/400 The Complete PC	Typist Caere Corporation
$399	$695
2	2
○	○
400	400
4 1	5
●	○
SCSI	SCSI
○	○
Mac Plus, 1MB	SE, 4MB, MultiFinder
Mitsumi	Alps
14	limited only by RAM
●	○
○	● (scan direction detected automatically)
○	●
●	○
●	○
○	○
○	○
●	○
256	2
○	○
5	0
3	1
MacPaint, PICT, PS/EPS, TIFF	PICT, TIFF

cut, copy, paste, and rotate rectangular sections of the scan, but you can't resize the image, nor can you touch it up by adding or removing dots. But the M-800 comes bundled with Silicon Beach's well-known gray-scale-editing program, Digital Darkroom (version 1.1; version 1.5 is sold separately), giving this package the most powerful set of image-modification tools in the lot (see "Gray-Scale Contrasts," *Macworld,* April 1990).

Digital Darkroom aside, the LightningScan's Thunderworks sports the most-advanced editing features. You can manually control gray-scale brightness, contrast, and nonlinear correction settings, or have the program attempt an optimal correction scheme (see "Plenty of Grays"). Numerous special filters are available, such as Darken, Diffuse, and Sharpen, which modify the shades of specific portions of the image or change the gray-scale map. The Sharpen filter, for instance, locates adjacent light and dark areas, making the light parts lighter and the dark portions darker. You also get a pencil and eraser for touch-ups. And don't forget the Skoogy, the only decent way to join separately scanned strips.

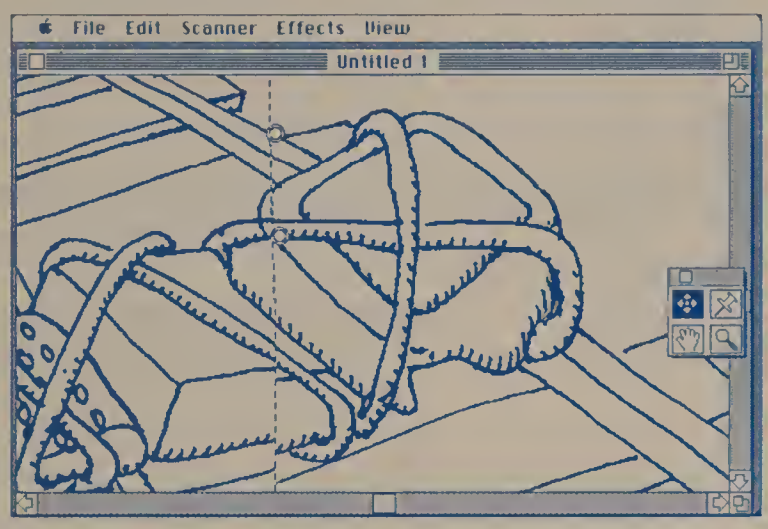
Not far behind Digital Darkroom and Thunderworks as a gray-scale editor, the NuScan Gray's software gives you a graphical image curve that reflects the brightness, contrast, and nonlinear correction settings that you set with scroll bars or by typing them in. As with Thunderworks, you can apply filtering such as sharpening and softening to selected areas of an image. Unfortunately, no pixel-by-pixel touch-up editing is possible.

Matching the Tools to the Task

Of course, whether you need this much gray-scale control depends on the work you're doing. Fiddling with all these image parameters, applying them to the image, looking at the result, and then making new changes in the parameters takes time—often a lot of time. In many situations, the simpler tools provided by The Complete Half-Page Scanner/400 (which provides lighten and darken filters, along with a few special-effect filters) and the ScanMan (which lets you set contrast and brightness only) may be

images or columns of text in one vertical strip. A Display While Scanning option lets you see a miniaturized replica of the scan as it is being received, so you can bail out in midscan if you see a major flaw. You can stitch together wide images by moving them in the Scan window, using the arrow keys for pixel-by-pixel control. While this is a smoother process than that offered by Thunderworks, the LightningScan's software utility, which requires that you use a merge command to join the two scans before you knit them together, the ScanMan's approach makes you move the images as whole tiles—you can't stretch or squish together parts of each scan to compensate for distortion in the scanning process.

Editing the Image The number, variety, and quality of editing tools provided by hand-scanner software vary widely from program to program. Even the simplest of the utilities, the Marstek M-800's ScanLink, lets you



Knitting Images Together The Join Files command in LightningScan's Thunderworks imports the left and right halves of a scanned image into a new file, as shown in the above screen. To align the two halves, you start by overlapping them so that the pair of images blends perfectly at one spot, tacking down this point with the tool provided. This screen shows the progress at this stage—the tacks are indicated by the small circles on the right-hand side of the dotted line.

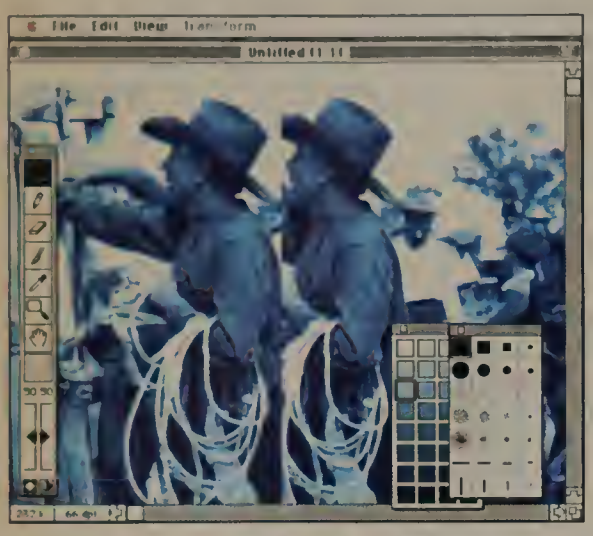
Notice that the rope and sides of the lower computer box are still misaligned. Now it's time for the Skoogy tool, with which you stretch the part of the right half that's below the tack until the ropes align. You can place as many tacks as you like to Skoogy-stretch different parts of the image by different amounts.

SOON TO BE SHIPPING

If the limitations of conventional hand-held scanners scare you off despite the scanners' affordability, try an alternative technology. By the time this article appears, Mouse Systems should be shipping its new PageBrush Color for the Mac, a hand-held scanner that lets you collect full-page scans without distortion. Here's how the PageBrush's scanning process works: before beginning a scan, you place a special transparent plastic overlay on top of the document. This sheet is embedded with a fine reflective grid that serves to keep the PageBrush oriented as you move it across the overlaid image in any direction you please. Since the PageBrush always knows where it is, you can "paint" a scan of any size up to the dimensions of the overlay, as long as memory holds out. The PageBrush functions as a mouse, too, so there's no need for a separate mouse and scanner.

Drawbacks? They're mainly price related. At $799, the PageBrush will cost somewhat more than most hand-held scanners, and it requires a Mac with a NuBus slot.

Four other hand-held scanners were not available in time for review in this article but should be out by the time you read this: a new gray-scale scanner from The Complete PC; the Animas Color Hand Scanner ($699), a 24-bit scanner that will include Read It OCR software and ColorScan MacCheese software; the ClearScan, a 12-bit color scanner from NCL America; and the NISCAN Spectra Mac, a 24-bit scanner with an image area of 4 by 6 inches and variable resolution of 50 dpi to 400 dpi for $899.



Stitching the Scan Together The ScanMan's software lets you stitch multiple scans into one image using a one-step process. In this screen I'm moving the right-hand image over to the left. When the cowboy's hat lines up exactly with the left-hand scan, I'll paste the images together, nudging the image pixel by pixel with the arrow keys, if necessary. Also visible is the Tools palette, which offers a handy eyedropper tool for picking up grays, and a sliding contrast and brightness control for easy image editing.



Plenty of Grays Though the LightningScan 400 doesn't actually detect shades of gray, the accompanying Thunderworks software can create them, and it provides plenty of gray-scale-editing control to boot. The Gray Map Editor lets you set contrast and brightness uniformly or draw your own nonlinear correction curve. The histogram displays the range of grays in a scan as you edit the gray map and apply filtering effects; a well-balanced scan should have a fairly even gray distribution. The vertical strip to the left in this screen offers a palette of grays for pencil drawing and area fills.

all you need. The Complete Half-Page Scanner also includes a useful crop tool for editing images.

All the programs store images as TIFF or PICT files. Ideally, however, you should be able to run the scanner and a desktop publishing program at the same time, funneling the images directly into a page-layout program, when required, via the Clipboard. Two models, the LightningScan and the ScanMan, include desk accessory versions of their software that allow you to do just that, assuming you have an adequate supply of memory.

Comparing Apples and Oranges

If you're looking for a final recommendation based on image quality, I'm going to disappoint you. True, the Sharp's color scans are gorgeous and, well, sharper than those of the Asuka (see "More Captured Colors"). But the Sharp is so slow that it's almost unusable. Unsurprisingly, the NuScan Gray, the only true gray-scale hand-held scanner reviewed, produces the best gray-scale images.

When it comes to the black-and-white units, you simply can't detect a difference in their raw scans. Careful editing is what determines the differences in the final image quality. Here your own skill—and patience—can be as critical as the software you're working with.

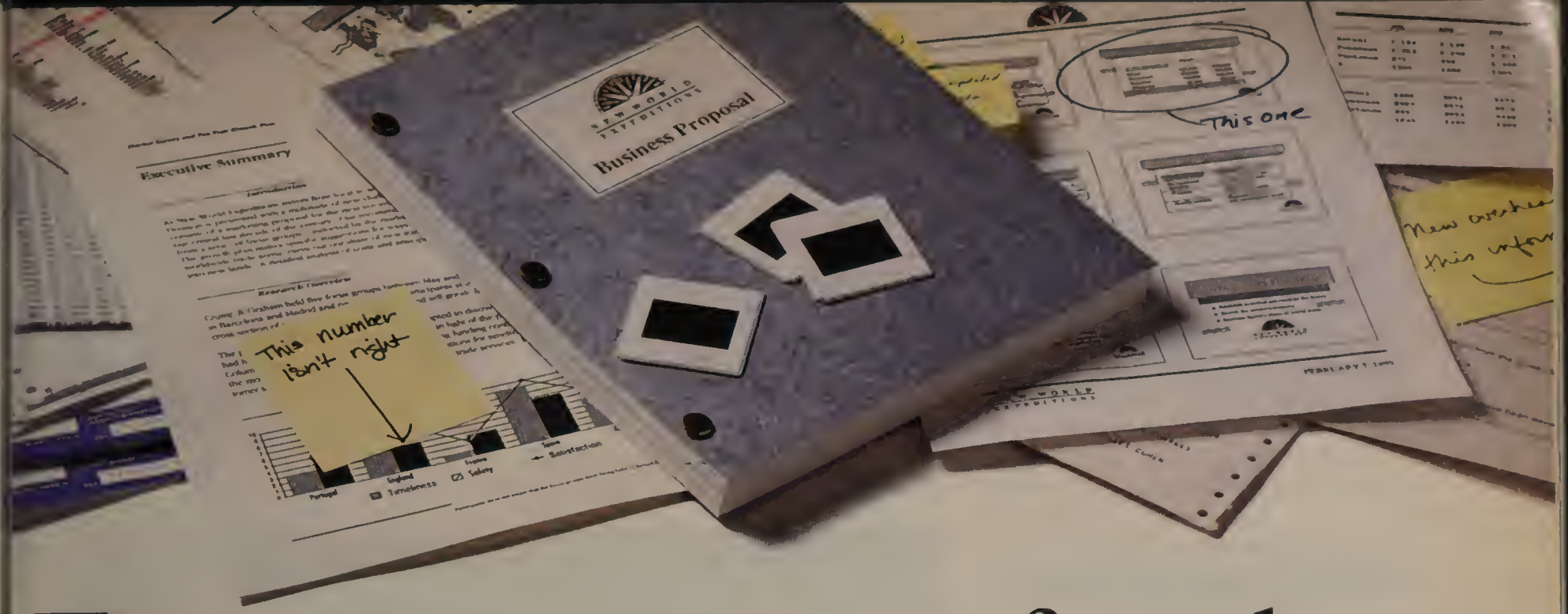
Despite these dodges, I recommend the LightningScan. It combines a clever case design, excellent editing features, and that incomparable tool, the Skoogy. Unless you have special needs, this is the model to get.

Still, the real question remains: Wouldn't it be smarter to buy a flatbed scanner? If you've got limited desk space, have a wild urge to scan your wallpaper, need to travel with your scanner, or do primarily on-screen or low-resolution print work, a hand-held model might just do the trick. But be sure you have counted the costs of working with those narrow scan strips—Skoogy or no—before you decide a hand-held scanner is all you can afford. ■

See *Where to Buy* for contact information.

At press time, *Macworld* was notified that Asuka scanners will now be marketed by Howard and Associates, under the product name MyScan.

Steve Cummings, *a budget-conscious image collector for many years, is a free-lance writer for a variety of computer publications.*



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REVIEWS

Entertainment and Educational Software

SIMEARTH 1.0

Pros: Addictive; educational; encourages endless experimentation; great manual; good use of color and sound. **Cons:** Addictive; concepts can be too abstract; basic scenarios identical; copy protected. **Company:** Maxis Software. **Requires:** Mac Plus; 2MB of RAM for color; System 6.0.2. Recommended: Hard drive. **List price:** $69.95.



PATRICIA MCSHANE

First there was SimCity. Now there's SimEarth, where you can control the evolution and development of an entire planet, not just a paltry metropolitan area. Yes, depending on your whims and moods, you can help miserable, sniveling, powerless life-forms evolve to see the glories of civilization—or wreak mass havoc on them with natural and technological disasters.

Sound addictive? It most certainly is. But don't mistake SimEarth for a game; it's actually a very sophisticated piece of simulation software (though Maxis prefers the term "software toy"). In SimEarth, the toy is the planet you create and manipulate. The object isn't to win, but to experiment with the program's simulation capabilities. In doing so, you learn about geology, ecology, evolution, and just how delicate the balance of life is on a planet.

The SimEarth simulator is modeled after James Lovelock's Gaia theory of evolution. The Gaia hypothesis argues that Earth (or any planet, for that matter) is a complete, self-regulating living organism whose parts—the geology, climate, atmosphere, and plant and animal life—affect one another.

Needless to say, creating and maintaining a planet—not to mention evolving a species—are complex tasks. As a result, SimEarth is a very complex program. There are lots of buttons, options, controls, graphs, and concepts to master (indicator number one of this fact is the SimEarth manual, which is several times thicker than SimCity's). Luckily, the manual does a stellar job of helping you run SimEarth, as well as understand the principles behind Gaia. Maxis also kindly provides an online tutorial and online help.

Shaping the Planet

There are four time scales in SimEarth: Geologic, Evolution, Civilization, and Technology. Each time scale simulates different periods of a planet's development. You can start a planet in any time scale, or start at the Geologic time scale and put the planet through all its paces. To advance to the next time scale, a certain amount of development must occur. For example, to move from Evolution to Civilization, one species must develop intelligence. SimEarth puts a time limit on the life of a planet. After 10 billion years, due to increasing levels of solar radiation, the planet will get so hot that all life on it will die. (This is also true of the real Earth.)

Because 10 billion years is a long time, the primary limitation in SimEarth is an abstract restriction called Energy. You use Energy to make, mold, modify, and manipulate the planet. Doing anything in SimEarth—from placing life to changing control panels (used to modify the simulator's Geosphere, Atmosphere, Biosphere, and Civilization settings)—costs energy. Energy restriction can put a significant damper on experimentation, but luckily, you can set up simulations that offer infinite amounts of energy.

SimEarth offers an almost endless list of chemical and geological factors to shape your planet. You can alter its atmospheric conditions, change its geological specifications, control its temperature, create or sink land masses, and cause earthquakes, volcanoes, and meteor explosions. In fact, two SimEarth scenarios let you

try to make Venus and Mars habitable (see "Mars Awaits").

Once your planet can support life, the Evolution time scale begins, and SimEarth's biological and human factors come into play. You can populate the planet with plant life—*biomes* such as Forest, Grassland, and Jungle—and animal life ranging from single-cell microbes to complex multicellular creatures.

Whether a biome flourishes depends on the temperature, the amount of rainfall, and the altitude of its location. Similarly, each life-form flourishes in a particular biome. There are 15 different classes of life, each of which has 16 species. Some species can evolve into another class; for example, some species of Fish can evolve into Amphibians; others mutate into Trichordates. (Trichordates died out a long time ago on the real Earth, but you can keep them alive on your planet.)

Teach Your Children Well

Once a class reaches the 16th species, it becomes intelligent and the Civilization time scale begins (see "Land of the Reptiles"). SimEarth offers seven levels of civilization, from the Stone Age to the futuristic Nanotech Age (technically part of the Technology Age). Each is characterized by an advancement in technology.

You "civilize" your intelligent life-form by dictating what energy sources it should use and how it should allocate that energy. For example, fossil fuels can be an efficient energy source but can also result in pollution that leads to a greenhouse effect. Allocating energy to science helps technology advance faster; investing in philosophy deters war. You can advance civilization artificially with some tools, most notably a *2001*-like monolith, but doing so might affect future generations. Get ahead of yourself and there won't be enough fossil fuels for energy when you need it.

Of course, all technology has its good and bad points. Higher technology results in a more efficient use of energy and a higher quality of life for planet inhabitants. It also means your planet may suffer pollution, wars, atomic accidents, and so on. Your job is to keep the planet habitable and to prevent the life-form from killing itself off as technology progresses. The closest thing to a winning scenario in SimEarth—called Exodus—comes when the Nanotech Age life-forms can take off in spaceships and populate other planets.

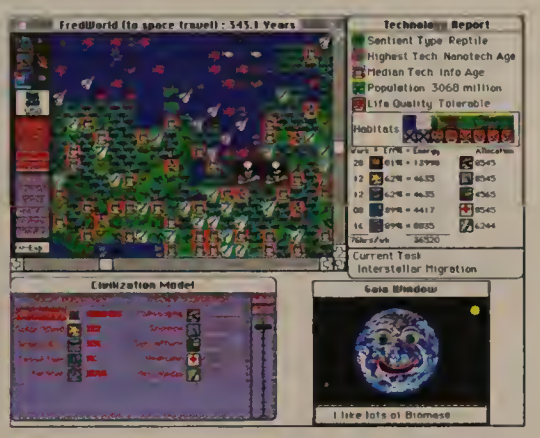
Trouble in Paradise

A couple of quirks in SimEarth did drive me crazy. First, the program is copy protected. You must answer questions to play (answers are in the manual). I can only hope that Maxis decides to follow the same route with SimEarth as it did with SimCity, which is no longer copy protected.

Second, you must click several times in a SimEarth window to bring it to the foreground; you also have to click several times in a close box to close a window. (No, SimEarth doesn't use the standard ⌘-W to close windows—another thing that bothered me.) The program uses so much processing power to run the simulator, especially when multiple windows are open, that it takes a while to detect a mouse click. If you have a color Mac system, make sure you run SimEarth in 16-bit color, or response time will be almost unbearably slow.



Mars Awaits Mars has problems: no water, almost no atmospheric pressure, no oxygen, no plants, and no animals. And the average temperature is a chilly –53 degrees Centigrade. For Mars to support life, you must create oceans, raise the temperature, and completely remake its atmosphere.



Land of the Reptiles SimEarth doesn't limit intelligence to mammals; when I played, it seemed to favor the reptiles. Even mollusks and fish can become intelligent, although it takes a bit of work to nurture them to that point. To keep civilization moving, you must carefully determine and allocate energy sources with the Civilization Model. You can monitor your progress by examining the Technology Report and by watching Gaia's facial expressions and messages.

SimEarth's underlying premise has some limitations too, simply because the simulator is programmed to follow strictly defined paths during planet development. A planet forms, its temperature and atmosphere stabilize, and evolution begins. But the most obvious limitation is the lack of any societal alternatives during Civilization. Due to restrictions on the way SimEarth societies develop, all intelligent life forms act the same. No matter if they're mammals or dinosaurs, they start at the Stone Age, evolve to the Iron Age, and so on, until Exodus. I would like SimEarth to support more than one intelligent species on a planet, but alas, it can't.

Earthly Considerations

Whether you'll like SimEarth depends on whether you're prepared for software that's not a game but a simulator. Feedback comes in the form of graphs, maps, and reports on abstract concepts like intelligence and energy. Icons representing life-forms appear, move around, and disappear. You don't see cities built, just icons that represent the cities. You aren't really part of the action; instead you control the action.

I must admit I was lukewarm toward SimEarth the first few weeks I played it. The program and its underlying Gaia hypothesis are complex and take time to learn and understand. But the more I played with SimEarth, the more compelling it became and the more I liked it. I enjoyed being able to change different settings and see their effects on the planet. It's not often that you run across a program that lets you experiment with it, much less encourages experimentation.

If you enjoy racking up points in shoot-'em-ups, you might feel that SimEarth is slow and aimless, and *(continues)*

frankly, you'll say, "What's the point?" But there is a point. In its entertaining fashion, SimEarth teaches you a lot about the world we live in, the forces that shape it, and the problems that threaten it. In the times we live in, it's easy to get so absorbed with details that you miss the big picture. That's what SimEarth shows you, loud and clear.—**Brita Meng**

See **Where to Buy** *for contact information.*

Input Devices

FOUR WACOM STYLUSES

Pros: Cordless, lightweight, and battery free; standard and pressure-sensitive versions available.
Cons: Not as convenient as a mouse for many nondrawing operations.
Company: Wacom. **Requires:** Mac Plus; Wacom tablet. Recommended: Pressure-sensitive software.
List price: Standard SP-200 and SP-210 $80 each; pressure-sensitive SP-300 and SP-310 $125 each; one stylus included with any Wacom tablet.

The Wacom digitizing tablets (one of which was reviewed in the April 1990 issue of *Macworld*) are fast gaining acceptance as the best drawing tools for Macintoshes and IBM PCs and compatibles. I use the 6-by-9-inch Wacom SD-510. Its small, lightweight design (less than 2 pounds) allows it to sit comfortably in your lap, perfect for those occasional times when you want to sketch from a reclining position. But elegant and compact as the drawing surface may be, the best part of any Wacom tablet is its stylus.

Before I go any further, let me admit to having been a confirmed tablet hater. Not only did I consider tablets too bulky, but I found the styluses to be clunky. And, after six years of drawing with a mouse, I was lazy; I didn't want to spend the time required to master a new tool. But a Wacom stylus changed my mind. The styluses bear a striking resemblance to a tool I already know how to use—the pen. They feel like a pen, move like a pen, trace like a pen. I was hooked.

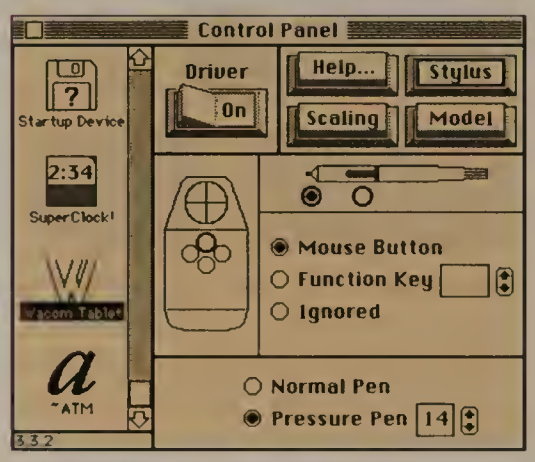
Wacom offers four styluses, all of which are cordless, allowing you to draw with unrestricted freedom. Remarkably, each Wacom stylus weighs in at less than half an ounce and contains no battery. At .43 inch in diameter, the styluses are slightly wider than a standard pen, about the size of a Sharpie marker. Best of all, stylus movements are communicated via the modem port at 9600 bits per second, several times faster than the maximum data-transfer rate permitted by the standard ADB ports. This makes for accurate, highly sensitive drawing on the Macintosh.

Every Wacom tablet includes your choice of stylus (or a four-button cursor). Additional styluses may be purchased separately. Most computer artists will want two styluses: a standard stylus for tracing images into an object-oriented drawing program, and a pressure-sensitive stylus for creating and retouching color artwork in painting or image-editing software.

Standard with Style

The two standard styluses are the SP-200 (which sports a gray band) and the SP-210 (red band). Each standard stylus has a removable tip and a side switch. With the Control Panel device, you assign the normal mouse actions to the tip or the side switch (see "Wacom cdev").

The only difference between these two styluses is the tips' sensitivity. The SP-200 is ultrasensitive, recording slight brushes against the tablet as mouse drags; the SP-210 is more suited to the casual artist primarily interested in using the stylus to select tools and choose menu commands.



Wacom cdev Every Wacom tablet includes a Control Panel device for specifying the effects of pressing the tip or side switch on a stylus. The Pressure Pen option box allows you to specify the sensitivity of a pressure-sensitive stylus.

For both standard styluses you should purchase a supply of plastic tips or color refills. The color refills are particularly useful for tracing traditional artwork, as they make the tip much easier to distinguish.

Stylus under Pressure

The SP-300 (blue and silver band) and SP-310 (red and silver band) have no side switches, only plastic tips. However, the tips are pressure sensitive; that is, they take into account how hard you press the stylus against the tablet. In this way, they are more like traditional drawing tools than are any other input devices currently available. For example, if you press lightly with a Flair pen against a piece of paper, you draw a thin line. As you increase the pressure, the line becomes thicker. The same is true when drawing with a pressure-sensitive stylus, except that the effect is more noticeable, more consistent, and more easily controlled.

Once again, the difference between the two styluses is measured in terms of sensitivity. The tip of the SP-310 is more pressure sensitive than that of the SP-300. Unless you have an unusually intense grip (do you find yourself breaking a lot of pencils?), the softer SP-310 is the more suitable choice. I also recommend the SP-310 if you plan to order only one pen. You cannot use color refills with the SP-310, however.

To take full advantage of a pressure-sensitive stylus, you need a compatible painting program. Right now, Adobe Photoshop, ColorStudio 1.1, Digital Darkroom 2.0, Easy Color Paint 2.0, SuperPaint 2.0, Studio/32, UltraPaint, Oasis, and the soon to be released PixelPaint Professional 2.0 register pressure sensitivity.

Wacom styluses are not the perfect tool for every job. I have yet to fully master choosing commands and selecting items with a stylus. Double-clicking can be particularly difficult. But for drawing, there is nothing better. Each stylus handles with a degree of precision and sensitivity unmatched by any other input device.

—**Deke McClelland**

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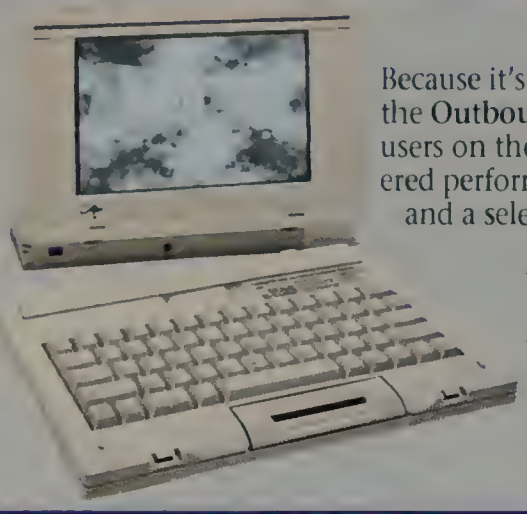
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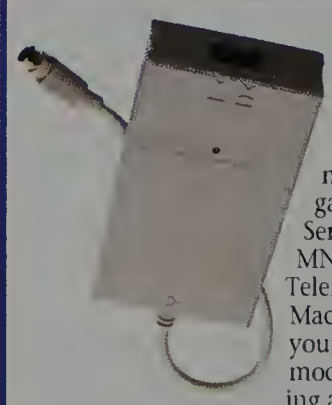
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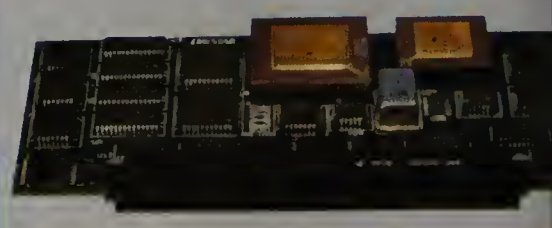
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…nMan 32 ..... *22751* $319

…enue
…Extended Keyboard ADB *25186* $99

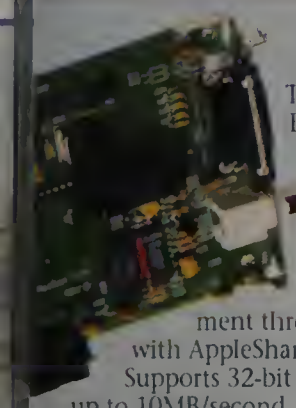
…500 Digitizing Tablet..... *23734* $295

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…110SE..... *26292* $207
…370ci..... *26294* $329
…illi
…ouilli Tape Cartridge B33C 44MB *57804* $95
…Magnetics
…nal Tape Back-Up 5040/60 ..... *23832* $529
…gton
… Classic Anti-Glare Clip-on Filter *26924* $49
…nti-Glare Clip-on Filter (platinum) *26922* $56
…nti-Glare Filter (platinum)..... *26883* $32
…able
… Speaker *26923* $179
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…anté MacCon+ SE/30E thk/thn *22526* $375
…anté MacCon+ IIET thk/UTP *22529* $375
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Adobe Plus Pack v1.0..... *29834* $129
Streamline v2.0..... *29269* $129
TypeAlign v1.0.4 ..... *29826* $59
TypeManager v2.0 ..... *29825* $57
Aldus
PageMaker v4.0..... *29781* $497
Personal Press v1.0 ..... *29916* $199
Broderbund Software
Typestyler v1.5 ..... *30450* $115
Claris
Claris MacWrite II v1.1 ..... *30586* $142
DeltaPoint
Taste..... *30638* $86

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The **QuadraLink** from Applied Engineering makes quick work of Mac II system expansion by adding four serial ports to your Mac. This NuBus card is easy to install and is compatible with System 7.0. A special "shadow driver" insures compatibilty with older software.

QuadraLink (Applied Engineering).... *26917* $205

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Correct Grammar v2.0 ..... *30633* $49
Microsoft
Microsoft Word v4.0..... *30582* $245
Reference Software
Grammatik Mac v2.0..... *30634* $50
Timeworks
Publish-It Easy! v2.0..... *29896* $145

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4th Dimension v2.1 ..... *27780* $485
ChipSoft
Turbo Tax..... *28500* $51
Claris
Claris FileMaker Pro *27789* $216
Claris MacProject II v2.1 ..... *29740* $366
Fox Software
FoxBase + Mac v2.1..... *27791* $292
Informix
Wingz v1.1 ..... *30184* $253
Intuit
Quicken v1.5 ..... *28458* $39
MECA
Managing Your Money v4.0..... *28467* $142
Microsoft
Microsoft Excel v2.2 ..... *30180* $245
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WillMaker v4.0..... *29888* $37



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MacAvenue Fun Pak II *29410* $49.95

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Personal Scan w/Recognize! (Dest)...*22762* $699

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I.B.S.
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Insignia Solutions
Soft PC AT- EGA Add-on Module..... *27716* $125
Soft PC v1.3..... *27714* $245
Sitka
MacTOPS Network Bundle *27682* $188
Technology Works
GraceLAN v1.0 ..... *27750* $219

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Accolade
Ishido..... *28776* $32
Addison-Wesley
Stupid Mac Tricks *28750* $19



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2 x 1MB SIMM Kit, 80ns *25480* $117
4 x 4MB SIMM Kit, 80ns *25481* $999
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1MB module for Mac Classic *25493* $89
3MB module for Mac Classic *25495* $199

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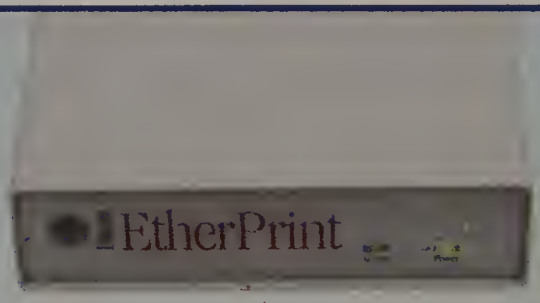
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Playroom v1.1	*28770*	$32
SimCity Supreme (Mac II)	*28680*	$47
SimCity v1.2	*28678*	$29
SimEarth	*28764*	$45
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Centron		
Casino Master	*28758*	$48
Casino Master Deluxe	*28760*	$58
Davidson & Associates		
Math Blaster Mystery	*27970*	$29
Electronic Arts		
Earl Weaver Baseball	*28768*	$32
Pipe Dreams	*28740*	$17
In-Line Design		
Darwin's Dilemma	*27840*	$31
Tesserae	*27838*	$30
MacAvenue		
Better-Living Pak	*29402*	$49.95
Software Toolworks		
Life & Death	*28658*	$32
Mavis Beacon Teaches Typing	*28056*	$32
Spectrum Halabyte		
Faces	*28766*	$24
Falcon v2.2	*28614*	$30
Tetris	*28606*	$22
Welltris	*28604*	$25
StudyWare		
ACT v1.0 w/ Cliffs Notes	*28046*	$29
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Braderbund Software		
Print Shop v1.3.1	*29836*	$35
Claris		
Claris HyperCard v2.0 Dev. Kit	*30578*	$145
Claris MacDraw Pro v1.0	*29205*	$289
Electronic Arts		
Studio/32 v1.0	*29318*	$445
Generic Software		
Generic CADD	*29280*	$99



Ethernet Connector for LocalTalk Printers

The **EtherPrint** connector simplifies the Ethernet/LocalTalk printer connection. The Dayna Etherprint makes a simple "plug-and-print" connection fast and cost effective. Includes adaptors for any cable/printer combination.

EtherPrint (Dayna) *22541* $355

Innovative Data Design		
MacDraft v2.1	*29241*	$275
Multi-Ad Services		
ProArt Sports	*29878*	$95
Paracamp		
Swivel 3D Professional v1.0	*29294*	$437

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Adobe Type On Call	*30560*	$49
Baseline		
Thunder 7	*30570*	$58
Berkley Systems		
After Dark v2.0	*30425*	$24



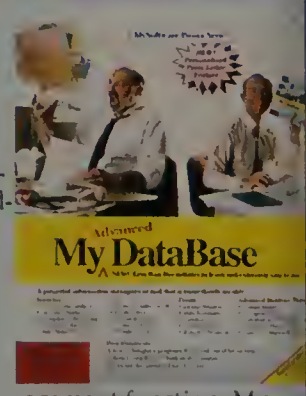
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The **DoveFax** gives you communications flexibili at a price that fits even the tightest budget. It com bines a 9600-baud fax modem with a 2400-baud Hayes-compatible data modem and will send or receive in the background.

DoveFax *22701* $2

Fifth Generation		
Suitcase II v1.2.3	*30402*	
GDT		
ParaLink Express	*30548*	
PrintLink Collection (Serial) v4.0	*30448*	
Ibis Software		
Protector Shark	*30538*	
Insight Development		
MacPrint v1.2	*30428*	
Micracam		
911 Utilities v1.0	*30550*	
Virex v3.0	*30415*	
Naw Saftware		
Now Utilities v2.0	*30498*	
On Technologies		
OnLocation v1.0	*30434*	
Pawer Up		
Letter Writer Plus/Address Book Plus v1	*29404*	
Salient		
Disk Doubler v3.0	*30546*	
Symantec		
Norton Utilities v1.0	*30437*	
SAM v3.0	*30343*	
Sum II v2.0	*30340*	

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MIDI Sample Playback Board

SAMPLECELL 1.1

Pro: Excellent sound quality; versatile software. **Cons:** Intermittent memory problems; slow screen redraw. **Company:** Digidesign. **Requires:** Mac II with NuBus slot. **List price:** $1995; with 8MB of RAM $2995.



One of the most dramatic advances in professional sound was the invention of the sound sampler in the late seventies: samplers enable musicians to expand their tonal palette to include any sound that can be captured with a microphone. While Macintosh users are spoiled by the built-in sound-sampling capabilities of every Mac (with the help of Farallon's MacRecorder), the quality has been severely lacking for professional musicians. SampleCell is a MIDI sample playback board that turns the Mac into a professional sample playback workstation.

Sample Cells

SampleCell consists of a NuBus board, Sound Designer II SC software (for editing sound samples), and a CD ROM with 630MB of sampled sounds. You load sounds into the SampleCell board from the CD ROM, after which you can play back the sounds from a sequencer or MIDI keyboard. SampleCell plays back up to 16 CD-quality (16-bit, 44.1kHz) voices (or notes) simultaneously, and these voices are dynamically allocated—as you release keys on the keyboard, they become available for other sounds. The board has four pairs of stereo outputs, useful for routing individual sounds to different effects processors before the mixing stage. The SampleCell system can only play back sound; in order to record your own sounds and load them onto the board, you need either Digidesign's Audiomedia or Sound Tools digital recording boards.

You also need a MIDI input device (such as a MIDI keyboard and corresponding MIDI interface). You could conceivably play only canned MIDI sequences from a sequencer program, but SampleCell is much more useful with a MIDI keyboard. Apple's MIDI Manager is used to connect SampleCell with the MIDI input source, typically a sequencer (I tested Opcode's Vision and Mark of the Unicorn's Performer, but any MIDI Manager–compatible program should work).

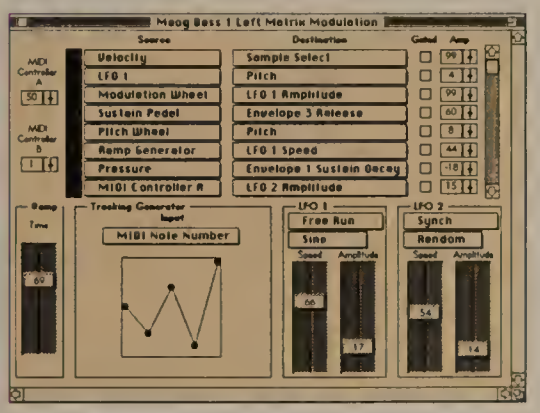
SampleCell can also be used with Digidesign's Deck in order to multitrack directly to a hard drive (you'll probably want a Mac IIfx to do substantial SampleCell-Deck recording. I ran into some performance and speed quirks using a standard Mac II).

Loading and configuring sounds is a pleasure: you visually map sounds to specific zones of the musical keyboard (or corresponding MIDI note range). You can map three sounds onto the same zone, with velocity cross-fading (different mixes of the sounds occur based on how hard you play the notes on a velocity-sensitive MIDI keyboard). You can create banks of custom sound configurations, and you have full control over each sound's volume, stereo placement, output routing, MIDI channel, and more. To further customize sounds, there are programmable envelopes, matrix-style modulation (with this feature, you can have a sound raise or lower in pitch based on velocity, or change samples with a foot pedal), and many more hard-core sound-tweaking tools. Professional musicians will like the sound-editing features.

The Sound of Music

I tested SampleCell with my favorite sequencer, Vision, with positive results. SampleCell appears as another instrument in Vision's instrument list, allowing you to choose the MIDI channels and/or instruments effortlessly. At one point I had all 16 voices screaming away, as well as a few external synthesizers, and the sound quality was, in a word, luscious. I did run into memory problems when configuring the board in the main SampleCell application (when I replaced a loaded sound with a sound from disk, the purged sound sometimes left artifacts in RAM, causing a free-memory problem), and at times I would have liked the configuration and mapping windows to redraw faster on my standard Mac II. According to Digidesign, the memory and performance issues will be addressed in the next release. The documentation is clear and informative, with full installation and operating instructions.

The SampleCell CD ROM includes a selection of basic instruments (pianos, strings, guitars, drums) along with more esoteric synthesizer sounds (including the prerequisite Moog bass sample). My only complaint is the loading speed, which is more of a constraint of CD ROM technology than a SampleCell problem. The Sound Designer software can also be used to convert a vast number of sounds from other MIDI samplers, making SampleCell a great addition to a sound studio already equipped with a MIDI sampler and a large library of sounds. As with any sampling application, you'll find that a large, fast hard drive is required if you plan to convert large numbers of existing sounds. Third-party sound distributors will be releasing other SampleCell-compatible CD ROMs, including an amazing Bob Clearmountain percussion library.



Matrix Modulation With the Matrix Modulation controls, you can make any source modulate any other source. For example, the velocity with which you hit the keys on the musical keyboard can determine the pitch or sustain of a sound.

Sample This

SampleCell is not for the casual Macintosh sound enthusiast: if you don't already own a mixer, a MIDI keyboard, and some sort of amplification system, you won't be able to do much with SampleCell. But if you have these basic components and want a MIDI sampler, you'll find the combination of SampleCell and Audiomedia to be price- and performance-competitive with anything you can find in the MIDI world today.

—David Biedny

See **Where to Buy** *for contact information.*

Page-Layout Software

VENTURA PUBLISHER 3.0

Pros: Extensive style sheets and document automation; support for long documents; top-notch table creation; equation editor; basic drawing tools; spot-color separations; compatible with PC version; supports footnotes, cross-referencing, tables of contents, and indexes. **Cons:** No search and replace; doesn't directly import Microsoft Word styles or Fast Save format; no based-on styles; no grabber hand; no pasteboard; skimpy manuals and online help; screen redraws frequently.
Company: Ventura Software.
Requires: Mac Plus; 2MB of RAM (more required to run some filters); hard drive. **List price:** $795.

For years rumors have been flying that Xerox had a Mac version of Ventura Publisher in the works. Well, it's here, and even though it's almost the same as Ventura 2.0 for IBM PCs and compatibles, which came out in 1988, it boasts features that Mac publishers (with the exception of a few FrameMaker users) have only dreamed of.

Publishing with Style

Style sheets are the heart and soul of Ventura. Almost all Ventura's formatting is via paragraph styles. You use the Tag tool to select one or more paragraphs (you can select noncontiguous paragraphs on a page). Then you use the Tags palette to apply a style. Any time you change the formatting for a given type of paragraph—"Subhead," for example—you change the formatting for all paragraphs tagged with that style.

The range of style controls exceeds anything seen on the Mac to date (see "With Style"). You can specify that a paragraph should fall at the top, middle, or bottom of a frame; set it to be as wide as the column or as wide as the text frame (great for wide headlines above multicolumn copy); indent the first *n* lines either absolutely or relative to the previous paragraph; set different left and right indents for left and right pages; rotate the paragraph in 90-degree increments; specify line spacing, as well as space below and space above the paragraph (you can even have Ventura ignore the space above the paragraph when it falls at the top of a column); and specify column and page breaks before the paragraph. You can specify line breaks before the paragraph, after the paragraph, both, or neither; this allows you to place two paragraphs on the same line—ideal for run-in heads.

You can specify up to three rule lines (their thickness and distance apart) above, below, or around a paragraph; they can run the width of the text, the paragraph margins, the column, or the frame, or they can be a custom width. Ventura allows up to 16 tab stops, with your choice of leader character and leader spacing. There are automatic drop caps and bullets (you specify the number of lines for drop caps, the size of the indent for bullets, and the type specs for both drop caps and bullets). You can control tracking, hyphenation, and justification parameters.

These controls are impressive, but then consider that you can invoke them simply by typing, for example, @subhead = at the beginning of a paragraph in your word processor. Import the file, and all those style settings are invoked. You cannot base one style on another, however.

Importing Text and Graphics

Ventura differs from other Mac page-layout programs in one significant way: it only provides hot links to imported text files, rather than actually importing a copy of the text. So when you change the text on the page, Ventura changes the source file itself.

In fact, if you simply import a file into a Ventura chapter, then save the chapter, Ventura completely alters the text file (see "Tags, Codes, and Styles"). It strips out any formatting except for type style, and inserts codes and tags that invoke Ventura's formatting controls.

Ventura ignores Microsoft Word's style tags when it imports (and won't import Word files in Fast Save format), converting all that formatting to its coding system. WordBridge, which now ships with Ventura Mac (it wasn't included in the first few months of release), converts styled Word documents to text files tagged for Ventura, with accompanying style sheets. WordBridge won't read Fast Save format either, however.

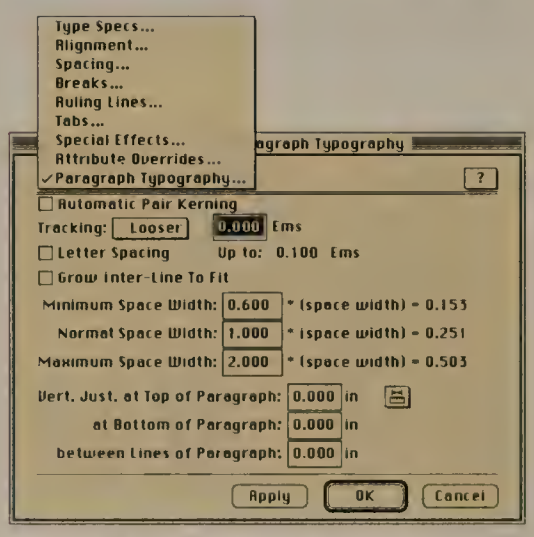
Ventura provides text filters for ten word processor formats and a dozen graphics formats (both Mac and PC formats are supported). The one conspicuous absence is a filter for Microsoft Word for DOS machines, though it might be available by the time you read this.

The spelling checker is pretty good, with smart suggestions for correcting misspelled words. It brings up the same misspellings repeatedly, however, rather than learning once you've told it to ignore the word.

Ventura provides basic tools for drawing lines, boxes (square- or round-cornered), and circles, as well as for making text boxes. These graphics are attached to frames, so when you move the frame, all the associated graphics move with it. This is especially useful for annotating a figure with call outs and arrows.

Tables and Equations

Ventura addresses the two most difficult typesetting problems—tables and equations—with an impressive set of tools. The table function allows for spreadsheet-type tables in which the cells expand downward to accommodate multiple lines of text. You can join multiple cells together to make a single cell, and take advantage of all Ventura's styles and typographic controls. The *(continues)*



With Style Ventura offers an impressive array of controls over paragraph styles. The Attribute Overrides dialog box is only one of nine dialog boxes that control styled paragraphs. You can jump between those dialog boxes using a pop-up menu.

Tired Of Being Held Up By Shady Characters?



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**Centronics* parallel interfaces not available for the original LaserWriter and LaserWriter Plus printers.*



Accel-a-Writer™

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program doesn't let you create *Consumer Reports*–style angled table heads, and you can only have one paragraph per cell, but with those caveats, Ventura's table function is the best available on the Mac.

Ventura's equation editor is competent, though it's not the behemoth you'll find in FrameMaker. It lets you build good-looking equations—simple or complex—without too much arcane coding. There's one bug here, though; if the Symbol font you use doesn't have the correct font ID number, trying to insert an equation crashes the whole program.

Automated Publishing

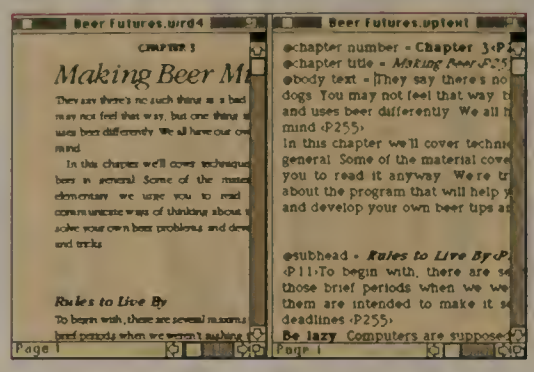
You can anchor frames (containing either text or graphics) to an anchor point in the text, and designate whether a frame should float directly above or below the anchor point, stay in a fixed place on the page but move from page to page as the text flows, or float within the text line itself. There's no command to float anchored frames to the top or bottom of the page, however.

Ventura's automatic numbering function maintains counters for chapters, pages, tables, and figures. It can start numbering these at the beginning of each chapter or continue the numbering from the previous chapter.

You can cross-reference either within or across chapters by inserting a reference to a named frame anchor or marker (a marker is a named position put in the text for the sake of cross-referencing). This involves creating a written list of markers and anchors to refer to (you can't just choose a name from a pop-up menu).

You can refer to a chapter, page, figure, table number, caption, section, or even a variable (a token that you insert to represent text that is still up in the air—a product name, for instance). Two key cross-referencing omissions are the abilities to search for unmatched cross-references (as FrameMaker can), and to jump to the cross-reference target.

Footnotes are straightforward; you insert a footnote reference, and Ventura creates a frame for you to type the footnote. When the reference moves, the footnote moves with it. Ventura can number footnotes from either the beginning of the chapter or the beginning of the page, but it doesn't handle end notes. You can create tables of contents, figure lists, and the like by specifying which tags to gather into the list, and from which chapters.



Tags, Codes, and Styles When you import formatted text (here, from Word), Ventura converts the file to a tagged and coded document, stripping out all formatting except type-style changes (bold, italic, and so on). Normally, Ventura doesn't pick up paragraph styles from Word; this file was run through WordBridge first, so style names were converted to paragraph tags, and the style formatting was converted to a Ventura style sheet.

To create an index, you enter index entries in the text. You can have two levels of entry—primary and secondary—with sort keys for each (*See* and *See Also* references are also available). Unlike in Aldus PageMaker, however, you can't see a list of existing index topics and choose one. You have to type the topic properly each and every time.

Manuals, Online Help, and Support

The manuals are execrable—made up largely of terse explanations of quite complex concepts and operations. The index is missing items like "import," "filter," "Microsoft Word," and "PostScript." Fortunately, a new manual is in the works.

The online help, though innovative in providing a pop-up menu with several help choices in every dialog box, is so concise as to be almost useless. Telephone support was helpful when I called, but you get only 60 days of support when you buy Ventura, starting with your first call. Additional support is $150 per year.

A PC Origin

While Ventura is a darn good port from the IBM, several aspects of its interface reveal that it is not at heart a Mac program. It won't use any font whose screen font name exceeds 30 characters. Double-clicking with the text tool doesn't select a word until you release the mouse button. Holding down the shift key while using the cursor keys does not select adjacent characters; instead, it jumps to adjacent pages. The Apply button in dialog boxes applies changes permanently; Cancel doesn't retract them. And you can't change type specifications (change to italic, for instance) and then start typing. You have to type the text, select it, then change the type specs. These are little things, but they are annoying, slow you down, and demonstrate Ventura's non-Macintosh origins.

On the other hand, those origins do allow for good transfer of files between the PC and the Mac. The Copy All Files command moves all the associated files—including font-width tables—between the two machines, though you often have to tell Ventura where to find files.

A few other problems are the fault of the program design. There's no search and replace. There's no pasteboard. You can only create spot-color separations, not process color. You can only rotate text, not graphics, and only in 90-degree increments. There's no grabber hand for scrolling around the page; you're limited to the scroll bars. And Ventura constantly redraws the whole page, even when you just apply a style to a paragraph. It even redraws the page when you open a dialog box.

Ventura is a better production tool than is FrameMaker, and it takes a different approach. Ventura is designed to integrate material from many sources, while FrameMaker is set up so that documents are created in the program from writing through editing to production.

Occasional page makers are better off with one of the more free-form programs like QuarkXPress, PageMaker, or Publish-It Easy. But if you aren't intimidated by numerous, deep dialog boxes; you plan your publications in advance; and especially, you produce long, structured documents, I highly recommend Ventura.—**Steve Roth**

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Database-Mapping Software

DESCARTES 1.01

Pros: Database is easy to learn and use; simple mapping and graphing operations. **Cons:** Handles only data created within or imported into Descartes database; limited map selection. **Company:** Intermap. **Requires:** Mac SE; 2MB of RAM; hard drive with 10MB of free space; System 6.0.3. **List price:** $795; demo disk $10.

MAPINFO 1.0

Pros: Reads existing databases directly; large inventory of available maps; handles SQL queries. **Cons:** Weak presentation tools; on-screen help needed to fully understand the manual. **Company:** MapInfo Corporation. **Requires:** Mac Plus; hard drive with 7MB of free space. **List price:** $695.

A map's task is to show you the lay of the land—where it is, what it is, and how to get there. Better than a report, chart, or graph, a map of a database presents information in a visual and insightful manner. Descartes and MapInfo are among the first Mac programs to put your data on the map.

By making locations visible in the logical format of a map or by identifying attributes of areas, a sales manager can intelligently divide sales territories, a magazine circulation manager can plot distribution strategies, a civil engineer can plan and follow the upgrading of a sewer system, and a governor can apportion the opposing party right out of the statehouse. With database-mapping software, not only can you see your data on a map, you can use the map and the geographical entities on it to query a database.

My Base or Yours?

With MapInfo, the ability to map data is essentially an enhanced reporting capability—the program is designed to be used with your current database program. MapInfo can read an existing database, as long as it's in DBF format (such as FoxBase+/Mac or dBase Mac) or in delimited ASCII, Lotus 1-2-3, or Excel format. You can also build a database in MapInfo or copy sections of existing databases into it.

Descartes is a member of a new generation of database software with mapping capability built in—the program isn't an appendage to your database program, it *is* your database program, and it can only map information that's been imported or entered into it. This distinction alone could scratch Descartes off the list for many potential customers—orphaning data by removing it from its home database isn't a good idea, and few current database users will be willing to switch to a new program just for Descartes's modest mapping capabilities. But Descartes might be the answer if you are shopping for your first database program and you're going to need mapping.

You can't find an easier database environment than the one built into Descartes. The metaphors and icons used to describe and manage database tasks and functions are an excellent primer in basic database concepts and operations, which makes Descartes great for beginners. It's not fast (in fact it can be painfully slow drawing maps), and it doesn't have the features of its high-horsepower competitors, but a simple database that you'll actually use is better than a complex one that intimidates.

Who's Got the Maps?

One obvious key to the quality of a mapping program is the maps themselves, and MapInfo is by far the more powerful product. You can zoom in, but you won't pick up any additional geographic detail as you get closer. At this writing, the modest Descartes map library consists of one basic U.S. map that comes with the program, an optional major-city boundary map, and optional maps delineating the marketing regions defined by the Arbitron and Nielsen consumer research groups. You can add state, county, and zip code boundaries as well as the locations of major cities and the entire U.S. interstate highway system. Intermap also offers a line of snap-in data products containing economic and demographic data.

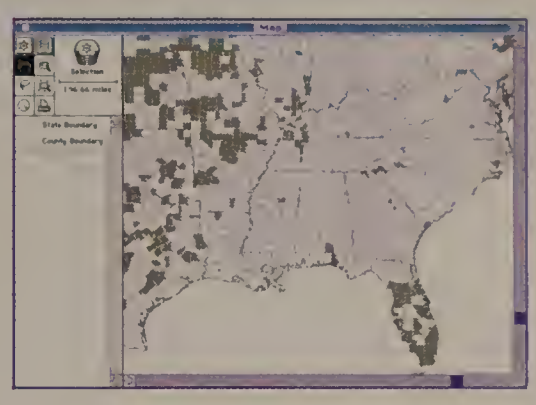
MapInfo Corporation, in contrast, is primarily a map company that also sells a tool for correlating database information. Its map offerings range from city, county, state, and federal levels for the United States right down to street and house numbers for major cities. It also has a growing stock of Canadian maps as well as sundry world maps. Prices range from less than $100 to tens of thousands of dollars for the entire collection of 1990 U.S. Census maps.

MapInfo definitely has the edge in map quality. Neither of the programs draws maps per se. Although you can draw custom maps with either program (or edit boundaries of existing maps), it is a freehand operation, and neither program does any boundary drawing for you, except for tracing boundaries that already exist (as in redrawing school districts following exact town borders). You could theo-

(continues)



City Map MapInfo's San Francisco streets look earthquake damaged, but they're accurate down to the street numbers. Here, the cursor was used to create a search for properties for sale within a quarter-mile radius of Powell and Bay streets, with the chosen blocks displayed in red. MapInfo can display query results in ranges, using different colors to symbolize a variety of, say, price ranges or income brackets.



S.E. United States A simple Descartes query to map counties with a median age over 37. The basket icon in the upper left is Descartes's symbol for the series of records used to build the map. Composite files of records can be built by dragging one basket of records onto another.

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Making the Right Connection

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retically draw a map of your office building and map all of the electric, water, and communication rights of way onto it, but this would be a forbidding amount of work.

Getting on the Map

Because MapInfo works with existing databases, you have to geocode your information—supplement it with references that enable the mapping program to correlate your data with the *x-y* coordinate system of its maps. Descartes, however, is a *map-aware* database (aware of its own maps, anyway), so geocoding is a basic step in all data input—every record contains a geographical field that links the record to the map. This is one of the benefits Descartes has derived from creating its own world from scratch, and it's likely that one day all databases will have a standard way of storing generic geocoding information.

Putting information onto a map is, for both programs, a matter of querying the database and layering the results over a map, as if on a series of acetate sheets. For repeated queries of the same type, both programs let you save the setup of map, selected data, and query type—a sort of macro, if you will. While both programs enable you to assemble complex queries and formulas from primitives you select from pop-up menus, only MapInfo lets you compose queries using industry-standard SQL syntax.

Finally, both programs are strategic tools, not presentation tools—the maps and graphs (à la spreadsheets) the programs create are adequate for planning or in-house purposes, but they aren't slick enough to be publication quality or to wow that really big client. Both programs work in color, but this is more useful for differentiating data than for making good-looking slides.

While both programs claim minimal hardware requirements, the more powerful your Mac, the better. In addition to the advantage this gives you in database searches, the extra power is also needed to draw the often very complex maps in a timely manner. Neither program has the equivalent of the greeking option offered by most typographic programs, which allows you to say "if the detail is too tiny, don't bother to render it—just give me a rough approximation." Instead, both programs endeavor to render with absurd detail (invisible at screen resolution) any map you ask to have displayed. Given this, what would be a long wait on a Mac II can become a looooonnng one on an SE.—**James Felici**

See **Where to Buy** *for contact information.*

CD Front End

MACSPIRS 2.0

Pros: Easy-to-use interface; powerful search operators; useful online help; flexible reporting options; fast searching. **Cons:** Show command defaults to all fields; browsing citations is slow; does not support background processing while searching. **Company:** SilverPlatter Information. **Requires:** Mac Plus; 2MB of RAM; Mac-compatible CD ROM drive; System 6.0.2; hard drive. **List price:** Annual subscription $495 to $4750. MacSPIRS included with each CD title.

Because the Macintosh has been so consistently innovative, it seems as if all the most interesting and useful technology gets to the Mac world before it reaches the DOS world. But go to a CD ROM expo and you'll learn quickly that there is a world of information being published on CD ROM that is unavailable to Macintosh users. That's the bad news. The good news is that SilverPlatter Information, a leading publisher of PC-based CD ROMs, now offers 31 CD ROM titles for the Macintosh, all based on its MacSPIRS (SilverPlatter Information Retrieval System) software.

Learn how to use MacSPIRS, and thousands of pages of information from business, education, agriculture, health, medicine, science, social science, and technology databases (including MedLine, ERIC, Peterson's College Database, Agricola, and ChemBank) are open to you. Each of these databases contains citations and abstracts of articles from leading journals and periodicals—an immense amount of useful data, at an extremely reasonable cost for anyone doing serious research.

Working without Icons

The best thing about MacSPIRS is the way it enables you to use a CD full of thousands of cryptic text-only records in a way that still feels intuitive, even familiar. The main window onto your information is the Search window. You enter your search items in the Search window and wait (but not long) as the software goes out to the CD and looks doggedly until it finds every incidence of your phrase, returning with a "hit list" of the number of records found. A simple one-word search of 150,000 records took less than a second; a good thing, too, since while MacSPIRS is searching, you are waiting—you can't use MultiFinder to do anything else.

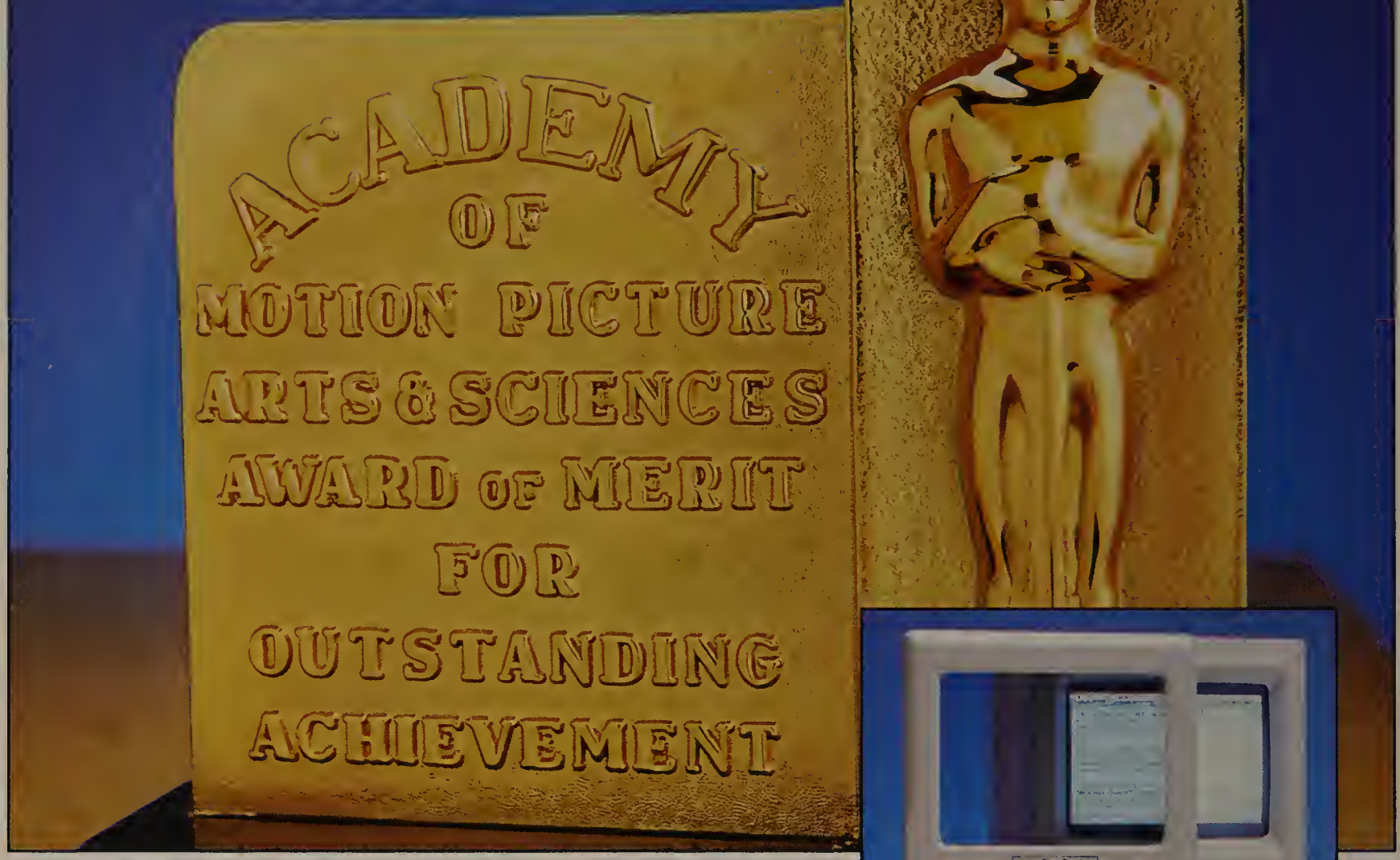
A simple search like that is useful, but only if you have a fairly obscure topic in mind. For instance, I searched the National Institute for Occupational Safety and Health's bibliographic database on the March 1990 OSH-ROM (Occupational Safety and Health CD ROM) for the word *magnetic*, and found 1132 records—far too many for an inspection of each.

A Bunch of Smooth Operators

Fortunately, MacSPIRS offers several ways to narrow a search like that. Words called *operators*, which can be typed or accessed through buttons, act as gatekeepers, focusing a search to yield only the records that will prove most useful. The And operator between two words retrieves only records that contain both terms. In my case, I typed in the words *ELF and magnetic* (ELF stands for extremely-low-frequency radiation), and the search yielded 54 records, a much more useful result. The operators Not, With, Near, and In help you search for a combination of words that appear in any given field, or any given sentence, and you can even specify how close to each other the words should appear. Using this simple vocabulary, you can quickly string together complex requests, such as to search through all of the 150,000 records in the database for only those records where the words *ELF* and *magnetic* appear within three words of each other in the same sentence in the abstract field.

(continues)

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Casting a Broader Net

Sometimes, however, a simple search yields too few hits. I searched for *magnetic field* and found only two records. Inserting the Or operator between two words allows you to broaden a search by retrieving all records containing either specified word.

Especially handy is the index, which contains a list of all the words related to your search in the database and the number of records containing each. Like a thesaurus, the index can help you widen your search by showing you synonyms for your topic; selecting any word or phrase enters it into the Search window automatically. If you select more than one expression, the program is smart enough to insert the Or operator between them, enabling you to build up complex search phrases without typing.

Special fields, called Limit Fields, are preindexed and permit especially fast searching, and special operators, including Less Than, Greater Than, and Equal To, can be used with Limit Fields to hone in on particular date ranges, often necessary for in-depth research. A search for all records that were published in 1989, containing either the words *ELF* and *magnetic* or the term *magnetic field* in the title field yielded the most useful results of all—seven records, every single one of them useful to my research (see "Zeroing In").

Why Read Manuals?

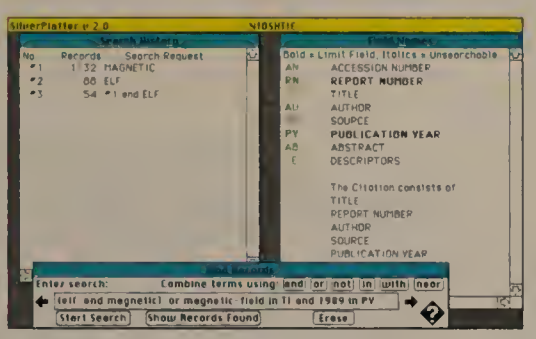
A black diamond with a question mark inside is present on every screen, offering access to context-sensitive help, and the Help menu offers even more detailed information about every program option. Even better, you can click on virtually any word in any open window to automatically copy that word into the Search window, helping to avoid the agony of searching a database for *valleyball* when you meant to search for *volleyball*.

When you choose the In operator, which must be used with the field name, a list of all the fields in the currently selected database appears. Again, dragging the cursor across the abbreviated field name enters it in the Search window, and clicking on the long name of the field brings up a window that explains the contents of that field. If you still somehow manage to enter an incorrectly phrased search request, MacSPIRS highlights the error, making it easy to correct your mistake.

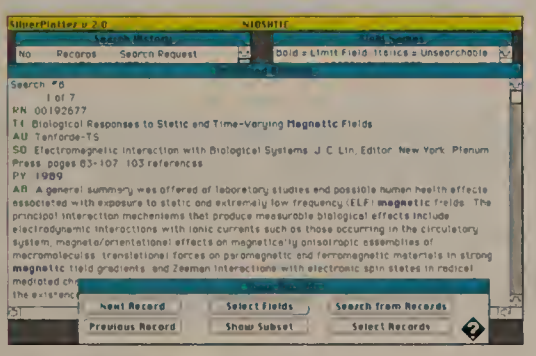
Seeing What You've Found

Once you've located the records you want, the Show Records command does just that, albeit a little slowly. Scrolling through a list of found records can be slow, since you have to wait for the CD ROM player for each screen—the slowest part of the process—to access the data. You can customize the way the records are displayed, choosing both the font and size of the text and the number of fields you'd like to see (see "Showing the Results"). If you're looking at a long list of records, you can first select only a few fields, such as the title and publication date, so that more will fit on a screen, then scroll through the list marking a subset of the records that look particularly germane to your subject. Clicking on the Show Subset button in the Show Records dialog box then displays only your marked selection. The only problem is that the next time you want to see your records, the program defaults to showing you all the fields—not bad with a large screen, but an inconvenience with a 9-inch screen.

Once you've found the citations, you can save them or print them out, again with full control over which fields you'd like to save and how you'd like them displayed. You also have the option of saving your search history (a running list of all of your queries during the session) and to highlight (usually boldface) your hits. My only complaint about MacSPIRS, in fact, is minor: you can't save your search requests for future sessions—a problem when you've finally found the exact way to ask for the records you are seeking and then are interrupted in the middle of your work. You can, of course, use your search history to re-create the request, but loading it from memory seems easier and more surefire.



Zeroing In The MacSPIRS Find Record dialog box lets you combine text searching with six operators—And, Or, Not, In, With, and Near—to create complex searches. In the upper left is the Search History window, where all previous searches are recorded, and the number of records found in each search. Clicking on the numbers at the left of each line adds that search to the current request and narrows or widens a search. In the upper right of the screen is a list of Field Names used in the database I'm searching; this window popped up automatically when I selected the In operator, because that operator requires a field name. To add a field name, I just point at it and click the mouse button.



Showing the Results Here I'm viewing some of the records found in my search. As I read through each citation, I can mark it with a mouse click; by selecting the Show Subset button in the Show Records dialog box, I can read through only my marked records. The Select Fields button allows me to select how many fields in the retrieved records I want to view. When I find what I need, I'll print or save my citations for further research.

Navigating Text with Aplomb

Although the plunge into text-based information is initially disorienting, MacSPIRS does an excellent job of making it as easy as possible. The use of multiple windows, bright colors for emphasis (if your Mac supports color), excellent on-screen help, full control over on-screen display, and the ability to add items to the Search window with a mouse click won me over; and the ability to quickly build complex, useful searches and the flexible reporting and printing options brought me back for more. Using MacSPIRS and the OSH-ROM CD, I found in minutes what an entire afternoon in the library might have failed to produce.—**Liza Weiman**

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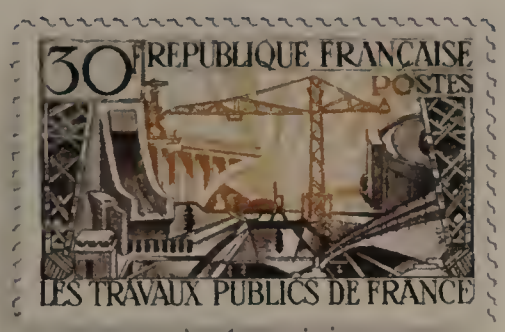
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* SOURCE: International Data Corporation, August 1990.

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MACWORLD EXPOSITION

Color Paint Program

STUDIO/8 2.0

Pros: Enhanced printing capabilities; Pantone Matching System support; reads and writes to wide range of graphic formats; reduced price. **Cons:** No color separation; no virtual memory; no pressure-sensitive input. **Company:** Electronic Arts. **Requires:** Mac II; 2MB of RAM; hard drive; color monitor. **List price:** $295.



Lobster in the Sky with Cyan The filter command enables you to adjust any range of colors in the current palette. On the left is my original image. On the right, I transformed the hues to new positions along the rainbow: blue becomes violet, red becomes green, and so on.

Studio/8 was the first program to convince me that color paint applications had the potential to reach the professional market. As its name suggests, Studio/8 supports up to 256 colors per document and now supports the 747-color Pantone Matching System. Since Studio/8 can't produce Pantone separations, this feature is provided primarily to approximate Pantone inks on screen and for use with programs such as Adobe Photoshop or Aldus PrePrint to output four-color process separations. The feature is well implemented, but generally unacceptable for more than proofing purposes.

More useful, perhaps, are two new features that enable you to alter the current palette. The first lets you reduce the number of colors in a palette. In an 8-bit program, you can use only 256 of the Mac's 16 million available colors. If one or more images has been imported using a scanning device or video board, the palettes might not share even a single color. By averaging colors in a painting—so that three slightly different shades of red, for example, are combined into one—you can reduce the number of colors in the palette without adversely affecting the painting's appearance. You can then paste an image copied from a differently colored painting, having made room for the additional colors.

The second feature filters one or more colors in a palette according to a selected color model. You can boost the percentage of red, green, or blue in a painting, as if the picture were viewed through a colored filter. You can also adjust the saturation in a painting or transform the hues. Not only can you create groovy special effects, you can adjust hues to equalize colors in a painting or, as with the previous feature, prepare an image to be combined with another by boosting or downplaying a range of colors.

New and Far Between

Studio/8 version 2.0 supports a wider range of graphic formats than any other 8-bit painting program does. As before, it opens MacPaint, PICT, and TIFF files and saves in PICT as well as color and gray-scale TIFF. It now supports LZW, an option that compresses TIFF files without any loss of color information. Version 2.0 also reads the Apple Preferred File Format used by the Apple IIGS, and reads and writes to Interlace Bitmap Format, making Studio/8 compatible with DeluxePaint, another color paint program from Electronic Arts that runs on various platforms including Apple, Amiga, Tandy, and DOS machines. Also new is a Resize by Percent command; a nudge feature for moving a selection; and a slightly improved dithering option, used to mix colors included in a gradation. But that's about it.

Personally, I'd like more. If you rely on scanned images, you'll find that Studio/8 can't properly interpret high-resolution PICT files. Everything comes in at 72 dpi, often resulting in a severe loss of information. Some antialiasing would be nice. And there's no allowance for pressure-sensitive input as there is in Deneba's UltraPaint and Creative Software's Easy Color Paint. Finally, Studio/8 won't load if the monitor is set to display more than 256 colors—a constant inconvenience.

2.0 Means $200 Off

While Studio/8 probably gets my vote as the most flexible, best organized, and most enjoyable color paint program, I can't honestly claim it's that much better than, say, UltraPaint or MasterColor from Preferred Publishers, both of which are priced $100 cheaper.

If you already own Studio/8 version 1.0, the upgrade to version 2.0 costs $30. But if you are really serious about painting, go all the way and upgrade to Studio/32. At $150 for registered owners of Studio/8 version 1.0, Studio/32 is a professional program that's well worth the fee.

—Deke McClelland

See Where to Buy for contact information.

Personal Information Manager

THOUGHTPATTERN 1.0

Pros: Very flexible way to manage information without organizing it; displays contents of external files; categorizes information in unlimited ways. **Cons:** Unsuited for planning and scheduling; too slow on a Mac Plus; interface confusing in places. **Company:** Bananafish Software. **Requires:** Mac Plus; System 6.0. **List price:** $199.95.

Computers are great for making sense of highly structured information, the kind that big companies and governments live on. But what about us, *(continues)*



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Linotype-Hell

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struggling with Post-it notes stuck to the dashboard, phone calls fading from memory, and directions scribbled down by someone who doesn't know left from right?

Software designed for that messy stuff is finally starting to appear. ThoughtPattern, the Mac's first serious personal information manager (PIM), was written by a programmer to help him write a novel. ThoughtPattern is a real database manager, ideal for wrapping structure around information without cramming it into records and fields. Unlike most PIM attempts, ThoughtPattern is not a scheduling or time-management tool, though it does have an alarm feature.

Itemizing

You throw a new bit of information into ThoughtPattern by creating a new *item,* a simple text window that holds up to 32K, or by importing text from a structured database. You can also link external files to ThoughtPattern items. ThoughtPattern displays the contents of text, paint, PICT, or EPS files, or launches the appropriate application and returns you to ThoughtPattern when you quit.

Tabulating

As you enter items into ThoughtPattern, you categorize them by assigning *tabs* (which later come in handy for *filtering*—retrieving items). You can assign an unlimited number of tabs to any item and assign any tab to an unlimited number of items, so you're never forced to lock information away in a single category. To create tabs, you select any word in an item and press a ⌘-*key* combination, or open the Tabs dialog box and type in the word. When you import data from a structured database, you can select the fields you want to convert to tabs.

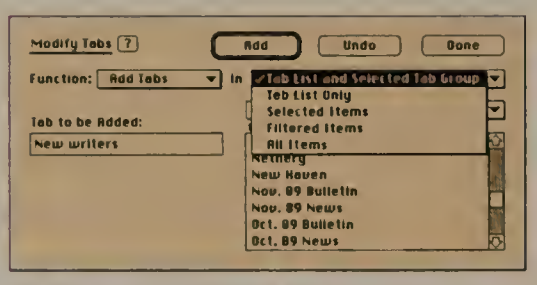
If you forget to create or assign tabs as your database grows, you can use the CrossIndex feature to search through the database and batch-assign lists of tabs. In addition you can search text to find occurrences of any word or to track down and assign tabs to items. Oddly enough, you can set up Boolean criteria for cross-indexing purposes but not for raw text searches.

As you create hundreds of tabs, the Tabs pop-up menu becomes unruly, but you can group tabs and show only one group at a time in the pop-up menu. Groups would be more useful if they could serve as a way to abstract categories. For example, my database of *Macworld* articles, people, and companies includes about 150 writers' names, all of which I made into tabs. I created a Writers group which, when it's the only active tab group, cuts the Tabs menu down to 150 entries. This number of entries is manageable for poking through items and assigning tabs, but to filter items, it would be easier to use a single Writers tab. (Cross-indexing all writers' names with the Writers tab is a workaround but goes against the grain of ThoughtPattern, because it makes you focus on how your data is organized instead of on content.)

Filtering

To find information, you set up reusable filters that can include any combination of tabs, tab groups, alarms, and item-creation or -modification dates. You can have ThoughtPattern display filtered items in a scrolling list or one at a time as index cards. ThoughtPattern provides alarms, including repeating alarms, and has built-in priority-level tabs and to-do filters. Unfortunately, though, the program doesn't show time-related information in a calendar format. This missing view would make ThoughtPattern not only a thinking tool but a working tool as well.

One bit of information is often a detail about another bit, so an outliner or other way of associating and viewing items hierarchically would also be very useful. In particular, tabbed information should lend itself to More-like cloning and gathering.



Modifying ThoughtPattern Tabs If you can't be bothered tabbing items as you go along, you can create tabs in batches and use the CrossIndex function to assign them to items.

Contemplating

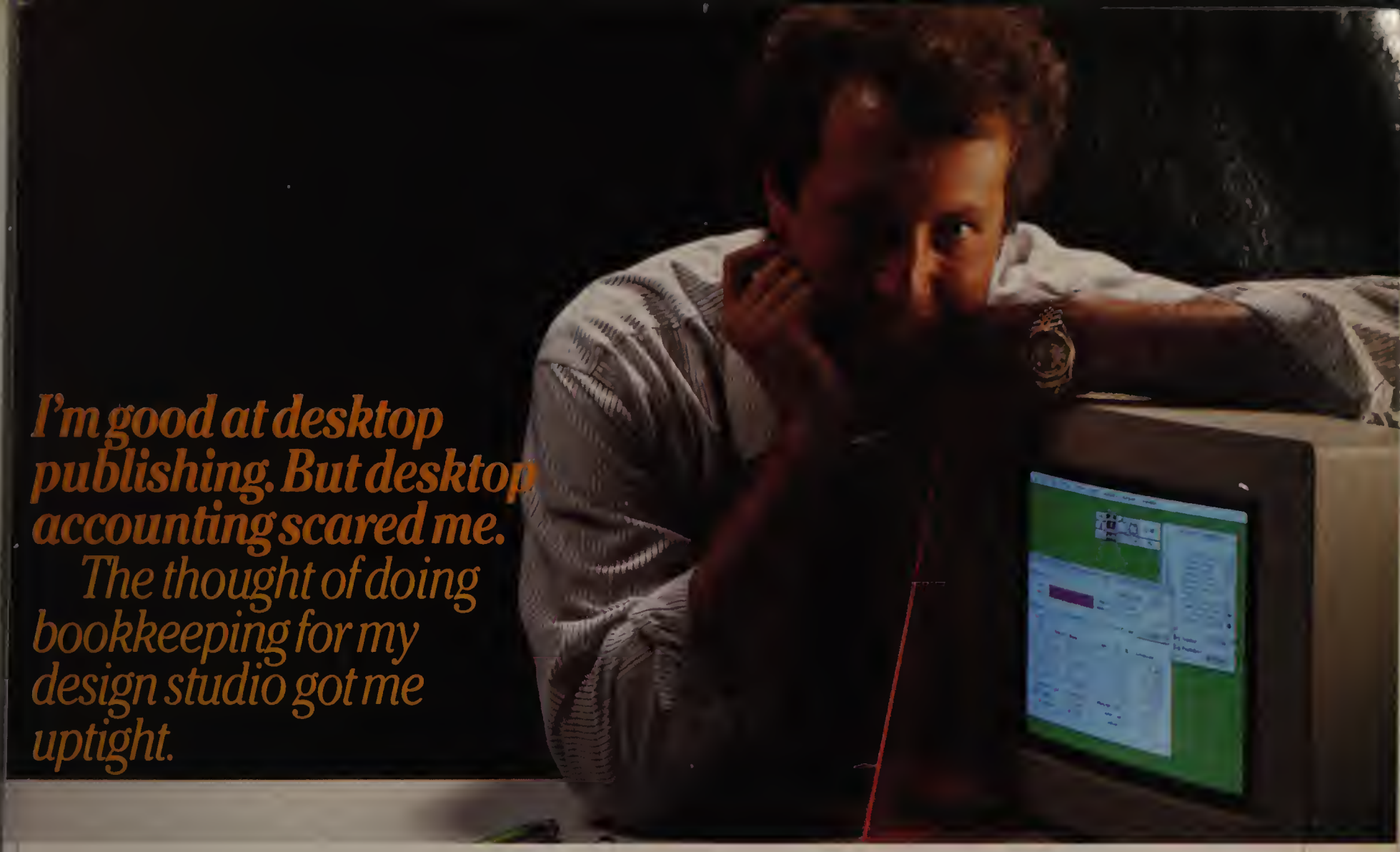
Like any version 1.0, ThoughtPattern is not a mature product. On a 2.5MB Mac Plus under the Finder, the program ran out of memory trying to import a 170K text file that contained 1000 records of 38 fields, though in normal use ThoughtPattern performed well with the recommended 500K partition. Twice the program created three new items when I asked for one. I was able to edit text from a linked file, but ThoughtPattern became confused when it tried to overwrite the original text file. And alarms sound only if ThoughtPattern is running (alarms can pop up from the background under MultiFinder). Bananafish is writing a bug-fix to deal with these problems and to add a few features.

I also miss the ability to open more than one file at a time and move items, tab lists, and filters between them—this is likely to appear in version 2.0, according to the company. Bananafish also says that version 2.0 will let you mix structured layouts with unstructured items, which would provide excellent control over printing (ThoughtPattern currently prints only whole items), and 2.0 will index files for greater speed.

ThoughtPattern's manual and online help are clear and concise but, like most manuals, explain only how to do things, not why. Learning to grok information in a brand-new way while trying to decipher a dialog box dense with scrolling lists, pop-up menus, and buttons will make you question your preparedness for the information age. Push on, I say—you'll get there.

ThoughtPattern is (excuse the buzzword) an enabling technology. It lets you manage and understand information in a way that paper and traditional databases simply can't. I hope Bananafish Software recognizes that products like QuickDex and DAtabase aren't in the same class, and concentrates on making ThoughtPattern as deep as Microsoft Excel or Nisus. It's already off to a good start.—**Dan Littman**

See *Where to Buy* for contact information.



I'm good at desktop publishing. But desktop accounting scared me.

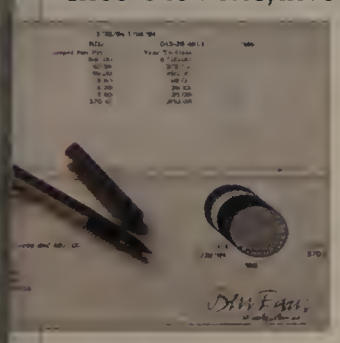
The thought of doing bookkeeping for my design studio got me uptight.

When I heard "balance sheet," I broke into a sweat. I know type, advertising, printing. Now I was forced to do our books.

No choice.

We were on our third part-time bookkeeper in eleven months, and she was called away suddenly. Sound familiar?

But I'm the boss and the buck stops with me. We had bills to pay, payroll checks to write, invoices to send, taxes to set aside.



And deadbeats to collect from–only I had no idea who owed us how much or for how long. Some suppliers may have even thought of *us* as deadbeats. I needed to know our cash flow, and get a handle on all this. But I didn't have a lot of time.

Step one: find an accounting program that feels as familiar as our Macs, that starts out easy, but has lots of reserve firepower for later on.

I found atOnce! The manual looked orderly. I dug in...

The familiar with the unfamiliar

atOnce! starts you off with a tutorial that uses HyperCard, one of my old favorites. I was at home.

Numbers are my nemesis, but the tutorial was actually fun and got me comfortable. It takes you step by step through the program, and gives you some easy-to-swallow accounting basics so you're not reading a foreign language. There's context-sensitive help, just in case.

And while you learn, you can start to set up your books. So it doesn't come in a flash and you sweat a little. But you do it and you learn.

I started off light. Double-clicked on one of the default charts of accounts and my General Ledger was practically set up for me. Then entered a few client names in Accounts Receivable, to get an idea of what was coming in. Prepared six invoices–and atOnce! calculated sales tax. Nice. Printed the invoices which I redesigned in atOnce!–realign a field here, change a font there. The usual.

Then ran a Customer Aging Report to identify the slow-payers (I had no idea such a terrific thing was even possible).

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What I didn't know was costing my company

I discovered a key client who hadn't paid in two months. I called and collected and now *he* wants to know about atOnce! I wrote payroll checks for the staff, and sent our bank a balance sheet I printed out myself–no sweat.



From fear and loathing to passion. Now I even study the management reports atOnce! generates.

I'm still an art director. But atOnce! helped me become a better businessman!

A hidden bonus that made my day

When our bookkeeper returned, I showed her atOnce! Now she even makes sure my plants are green. Putting the books on the Mac lets me take control.

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Character-Generation Software

VIDEOQUILL 1.0

Pros: Antialiases text; blends millions of colors; good special effects such as drop shadows and transparency; imports and exports pictures easily; good text-manipulation features. **Cons:** Drawing capabilities limited to rectangles; limited to Data Translation fonts; companion video graphics board required for live video output to tape or monitor. **Company:** Data Translation. **Requires:** Mac II, 2MB of RAM; System 6.0.3; 32-bit color QuickDraw. Recommended: Hard drive; 16-bit or 24-bit color monitor. **List price:** With 9 standard fonts $495; with 56 fonts $695.



Character generation for film and video is a big business, usually requiring sophisticated machinery that can cost between $30,000 and $100,000. While VideoQuill is not really a replacement for this equipment—VideoQuill's production speed and image quality are not as perfect as those of a professional character generator—it does produce high-quality text at a fraction of the price of other systems.

Special effects are VideoQuill's most obvious strength. Text can be colored, stretched, oriented in different directions, or filled with pictures, without any noticeable loss of text quality. You can blend colors inside or outside the text to create backgrounds whose colors blend smoothly—from top to bottom, side to side, or diagonally.

VideoQuill's antialiasing feature enables you to smooth text and eliminate the jagged edges normally found in computer-generated letters. The quality of the antialiased text is good for most desktop graphic needs but is not up to the quality produced by equipment such as the Quantel Paintbox. VideoQuill's text edges soften and are not as crisp as those found on more expensive systems.

Text manipulation is incredibly easy with VideoQuill. All of the commands are menu-driven, and you can tear off individual menus and put them in convenient areas of the screen.

Limited Font Selection

The basic VideoQuill package comes with 9 standard fonts, and 47 additional fonts are available in a Supplementary Font Package for $200 more. Unfortunately, you are limited to the fonts that Data Translation has selected, which means that if you have specific font requirements, VideoQuill probably isn't for you. The inability to use PostScript fonts or other large font collections is a significant drawback to VideoQuill.

Picture Perfect

Although the thrust of the program is to manipulate text, VideoQuill also allows you to arrange layouts of pictures, text, and rectangles on screen—so, for example, you can easily produce the title screen of a video. Pictures can easily be imported and exported as TIFF or PICT files. Once you've brought a picture into the program, you can scale or crop the image proportionally or nonproportionally with an arrow tool.

The program also enables you to create rectangles or squares and fill them with solid or blended colors. Be forewarned, though, that this is a limited feature—you can't manipulate the shapes much more than resizing them. The program would be much improved if it let you create other graphic shapes or manipulate shapes to a greater degree, such as by rotating or skewing.

Millions of Colors

The ability to use color creatively both in the background and within letters is a powerful feature of VideoQuill, but its usefulness depends in part on the system's memory and type of monitor. To get the most out of the program, you need to run 32-bit color on the Macintosh and should have at least a 16-bit or 24-bit true-color monitor. You need at least 2MB of RAM for the application, and you should have a minimum of 4MB for large images if you don't want to wait endlessly for the images to be redrawn.

With enough memory, however, you can produce very nice color blends. Thirty-two-bit color allows you to choose from millions of colors for your blends. VideoQuill contains a dithering feature to soften the banding effects between colors, but this feature requires significant memory and slows down the redrawing function even more. The solution is to turn on the Fast Display function, which turns off both antialiasing and dithering.



Top-Quality Text by the Box VideoQuill offers excellent text-handling capabilities for a reasonable price. You use a text dialog box to fine-tune titles by defining alignment, kerning, drop shadows, leading, horizontal and vertical scale, transparency, and rotation.

Video Board Supercharges System

If you work with video images and you want VideoQuill to output live video to a screen or accept live video images to manipulate, you need to purchase a separate Data Translation ColorCapture video graphics board. The board acts as a conduit for both incoming and outgoing video images, giving you the ability to connect up to three video input sources to the system.

Once the board is installed, you can produce some extraordinary special effects. For example, you can fill text with live video. Or you can label or paint over live color-video images and send the images to videotape or to an external monitor. The board also acts as a program enhancer, permitting you to scroll images on the screen and zoom in, zoom out, and pan.

VideoQuill is another example of the quantum leaps that video technology has taken on the Macintosh. While the technology is not yet available to completely replace a $100,000 professional character generator, VideoQuill comes pretty close—and for a substantially reduced price.—**Mike Dashe**

See **Where to Buy** *for contact information.*

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DEADLINE

Macworld must receive all entries by Monday, July 8, 1991.

JUDGES

- Patrick Coyne (Editor and Designer, *Communication Arts*)
- Hugh Dubberly (Chairman, Computer Graphics Department, Art Center College of Design, and Creative Director, Apple Computer)
- John Lasseter (Animation Director, Pixar)
- Jane Palecek (Art Director, *In Health*)
- Robert Riley (Curator of Media Art, San Francisco Museum of Modern Art)

CATEGORIES

- Animation
- Fine Art
- Graphic Design
- Illustration
- Informational Graphics (charts, maps, diagrams, graphs)
- 3-D Modeling and Rendering
- Technical Illustration (medical drawing, architecture, and mechanical design—no drafting)
- None of the Above

RULES

Maximum four entries per person. Entries will be judged on technical innovation and aesthetic value. Send disk copy and hard copy of each entry (submit animations on disk or VHS-format tape). Entries will be returned only if accompanied by preaddressed packaging with correct postage. *Macworld* is not responsible for loss or damage. Entries must be original and entrant must have all permissions necessary for *Macworld* to use the artwork. Submission provides *Macworld* with a nonexclusive right to use or publish your work in any manner in connection with the art contest. *Macworld* employees and their relatives are not eligible. For more information, call 415/978-3149.

With each entry include this form or a photocopy (FILL OUT COMPLETELY AND SIGN), a detailed technical description of how you produced the work, and $10 per entry. Send entries to: Macintosh Masters IV Art Contest, *Macworld*, 501 Second St., San Francisco, CA 94107, USA. Make checks payable to *Macworld*.

Name _____

Address _____

_____

Phone number(s) _____

Title of work _____

Category _____

Submission format:

☐ Disk ☐ Hard copy ☐ Video (VHS) ☐ CD ROM

☐ Slide ☐ Photo (for mechanical design only)

☐ Other _____

Required to view art:

Hardware _____

Software (include version number) _____

_____

☐ Please return (postpaid preaddressed packaging included)

Signature _____

WINDOW SHOPPING

by Lawrence Stevens

This month I review quotation databases, HyperCard scripting and importing utilities, one game, one screen saver, an adjunct to Apple's Finder, and some shelves to hold hardware



RON CHAN

Quotemaster Plus/Mac 4.0

Quotemaster Plus/Mac ($89 from PennComp Software Development) provides 3000 quotes from more than 600 famous people. The best aspect of this program is its ability to search for quotes by topic, author, time period, or any combination. You can also do a hierarchical search, in which the program helps you determine the topic you want by presenting three boxes of increasingly narrower search topics.

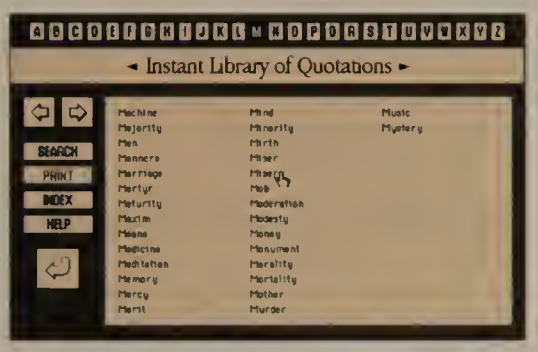
The manual devotes only five pages to how to use the program, neglects to explain some functions, and is confusing on others. The section on hierarchical searches is especially difficult to follow.

The interface also has some unpleasant surprises. For example, when you click on the Help button, instead of getting help, you get a dialog box that instructs you to press option-H. In order to enter a search parameter, such as an author's name, you have to begin typing at the extreme left side of the text-entry box, or the search won't work right.

Instant Library of Quotations 1.0

Instant Library of Quotations ($49.95 from Nova Development Corporation) has weaker searching capability than Quotemaster Plus/Mac. Still, I prefer Instant Library of Quotations for three reasons: it has a better user interface; it has 2000 more quotes (a total of 5000); and it costs $40 less.

The easiest way to find quotations is through the Table of Contents. Each screen displays the alphabet along the top; you click on a letter to go to a Table of Contents card that lists all the topics beginning with that letter. You click on any topic to see the card that contains all the quotes for that topic. You can also use the Index, which works just like the Table of Contents except that it contains author names instead of topics. You can search for any set of characters through HyperCard's Find dialog box. You can't, however, search by time period, use a combination of parameters (such as author plus topic), or do hierarchical searches (all available in Quotemaster Plus/Mac). Still, with its lower cost and larger number of quotes, its interface makes Instant Library of Quotations, in my opinion, a better buy.



Finding Quotes Clicking on any letter brings up the Table of Contents screen for that letter. Next, click on any topic name and you go to a scrollable screen that contains quotations related to that topic.

Expert Backgammon 1.85

Expert Backgammon ($65 from Komodo Software) lets you play backgammon against the Mac. It is suited for players from novice to expert.

For novice players, the program provides aids to make game playing easier. For example, when you click on a counter, if there is only one legal move, the counter moves to that spot. If there is more than one legal move, the program displays arrows indicating all the legal spots. If you make a mistake, the program lets you take back moves or rethrow the dice. It also helps you keep track of each turn by graying out one of the two dice after you've moved the number of spaces indicated. The other die remains highlighted until you complete your turn.

For more advanced, serious players, Expert Backgammon provides numeric analysis of each game. For example, at any point in the game, Expert Backgammon can indicate the number of moves each player has remaining before the game is completed, and estimate each player's chances of winning.

MasterFinder 1.0

MasterFinder ($99 from Tactic Software) comes in an application and DA version and displays the directories of up to four volumes (hard drives, floppies, CD ROM drives, and so on) at one time. You can use those directories just like Apple's Finder to launch applications; get info; create new folders; rename files and folders; and move, duplicate, or trash files.

(continues)

But MasterFinder provides a good deal of information not available from Apple's Finder. For example, you can view the entire directory tree—the hierarchy of files and folders—of any disk or folder.

MasterFinder also gives you some of the features available in many of the best Mac utilities. Like HandOff (from HandOff Corporation), MasterFinder enables you to launch an application by clicking on a file that was not created by that application. Like KiwiFinder Extender (from Kiwi Software), MasterFinder can search for files by name, type, creator, size, or modified date. And like Offline (from SNA) and Cataloger (from Masters Publishing), MasterFinder can catalog disks so that their contents are listed even when the disks are not online.

If you have hundreds of files, high-capacity drives, or large disk libraries, MasterFinder can be a real asset.

Peacock 2.0

Because HyperCard is so different from other Macintosh applications, exporting and importing files between stacks and non-HyperCard applications can be difficult. Peacock ($69 from Cyan) simplifies the process.

An import utility has three basic tasks: providing a means of indicating the delimiters that separate the fields and records of files to be imported or exported; allowing you to specify that only certain fields be imported or exported; and indicating where the imported data is to be placed. Peacock excels at all three of these tasks.

First, it guesses the delimiters based on the structure of the imported data. (If it guesses wrong, you can indicate the correct delimiters using a pop-up menu.) And Peacock can automatically strip extraneous delimiters such as quotation marks.

To help you indicate which fields are to be imported or exported and where the data is to be placed, Peacock provides a point-and-drag window (see "Matching Fields").

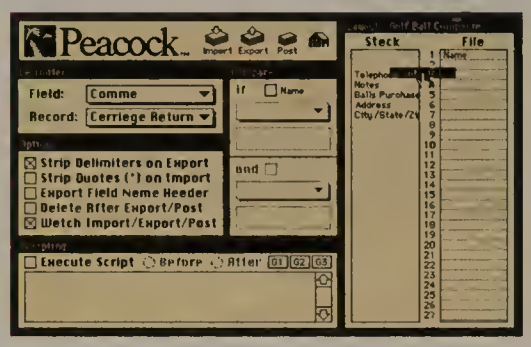
Peacock makes importing and exporting so easy, you need very little knowledge of HyperCard to use it.

ScriptEdit 2.0

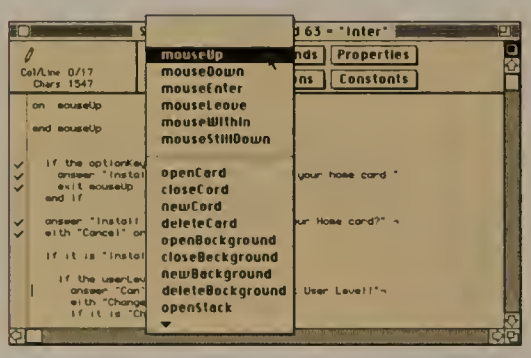
If you develop HyperCard scripts, ScriptEdit ($59 from Somak Software) can reduce your typing tasks, reduce your syntax errors, and help debug your programs.

When ScriptEdit is installed, the script window of any HyperCard field, button, card, or stack contains six scrollable pop-up menus: Messages, Keywords, Commands, Functions, Properties, and Constants (see "ScriptEdit's Scripting Window"). Each menu lists HyperTalk keywords that are automatically entered into the program when you select them with a mouse pointer.

To use ScriptEdit's debugger, you click in the margin next to all the lines of code you want to have checked. Then, when the script is activated, the program stops immediately after it performs one of the indicated lines of code. A Debug menu then appears, allowing you to either continue if the script worked properly or alter the script. You can also have ScriptEdit display a Variable Watcher window, which shows the contents of variables in the script, and a Message Watcher window, which lets you view the messages HyperCard objects are sending to each other.



Matching Fields The HyperCard field names are listed under Stack. The numbered boxes under File represent the fields in the non-HyperCard application. To have the contents in the HyperCard field named Contacts appear in the third field in the Non-HyperCard application, drag the word Contacts from the Stack side to box number three in the File side.



ScriptEdit's Scripting Window The six pop-up menus at the top (two of the menus, properties and constants, are fully visible) allow you to enter HyperTalk keywords with a mouse-click. In the margin to the left of the script you indicate lines of code that you want debugged. The status area at the upper left indicates the number of characters and lines of code.

Protector Shark 1.1

Protector Shark ($49.95 from Ibis Software) is screen-saver software. When the Mac has been idle for a user-specified number of minutes, Protector Shark displays a simple animation of a scuba diver and a shark. When, occasionally, the two figures meet, each tries to kill the other.

You can also use Protector Shark as a game, controlling the movements of the diver (by moving the mouse) and having him throw spears at the shark (by clicking the space bar). You can also (with a mouse-click) see how many times since the screen saver was activated the diver has speared the shark and how many times the shark has eaten the diver.

Last month I reviewed the screen saver After Dark (from Berkeley Systems), which costs only $39.95 and gives you more than 30 choices of animations. Is Protector Shark's single animation better then After Dark's 30? Personally, I think not.

Mac Minder, Mac II Minder, Mac Side Minder

Mac Minder, Mac II Minder, and Mac Side Minder ($49.95, $39.95, and $89.95, respectively, from Skene Design) are stands that help clear your desk of clutter and give your computer a lighter, less bulky look.

The Mac Minder raises any single-unit Mac (such as the Classic, Plus, or SE/30) or a Mac II–series monitor about 3 inches and inclines the screen slightly backward. It makes the display easier to view and provides a small shelf under the Mac for a keyboard, floppy drive, or small hard drive. The Mac II Minder does the same for the Mac IIcx/IIci CPU.

The Mac Side Minder hangs the Mac IIcx or IIci CPU off the side of a desk. If the desk has an overhang of at least 1¾ inches and the overhang is between ½ and 2 inches thick, you can attach the Mac Side Minder using a clamp. M

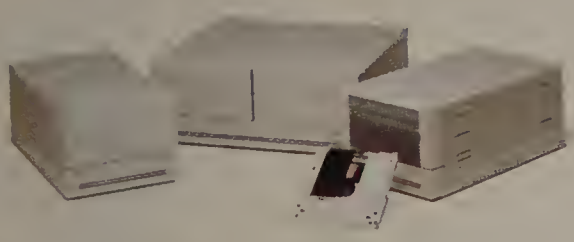
See **Where to Buy** *for contact information.*

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Our new slimline ZFP (zero footprint) models, for instance, reflect giant steps of their own – and leave no footprints. Tucked smartly under the Mac Classic,™ or just as smartly between the Mac si™ chassis and monitor, they're available in 50, 100, and 205 MB capacities. And they're among the fastest in the industry. What's more, they include comprehensive disk management software, with advanced features like disk mirroring and volume spanning.

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To be called Circle 176 on reader service card

For literature circle 127 on reader service card

Adobe and PostScript are registered trademarks of Adobe Systems Incorporated and are registered in the U S

THE PLUS IS DOS/MAC COMPATIBILITY.

Introducing the Kodak Ektaplus 7016 printer. Equipped with Adobe PostScript language/Appletalk interface options, it can support both DOS and Macintosh computers simultaneously! Configure it with four ports, and it can support up to four users, or even four networks. Six emulations make it an ideal shared printer for any work group.

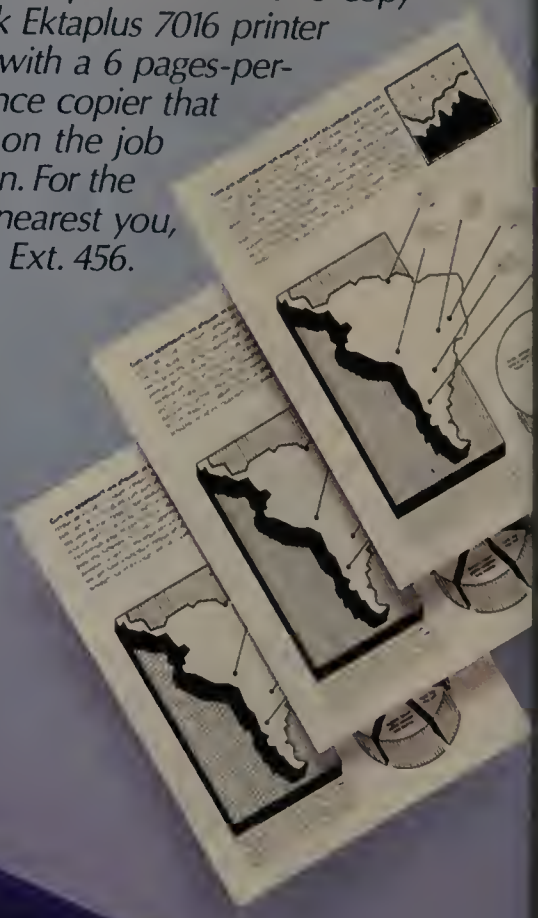
THE PLUS IS 16PPM SPEED.

Twice as fast as traditional printers, the Kodak Ektaplus 7016 printer can make you at least twice as productive. It maintains fast, high-quality throughput, even when printing Adobe PostScript language. It helps you get more done in a day.



THE PLUS IS A COPIER.

Imagine the convenience of having a built-in copier for those frequent one- or two-copy jobs! The Kodak Ektaplus 7016 printer comes standard with a 6 pages-per-minute convenience copier that keeps everybody on the job instead of on the run. For the name of the dealer nearest you, call 1 800 344-0006, Ext. 456.



THE PRINTER WITH A PLUS.

KODAK

Kodak Ektaplus 7016 printer

Circle 377 on reader service card

NEW PRODUCTS

Edited by
Mary Margaret Lewis

This section covers Macintosh products formally announced but not yet evaluated by Macworld. All prices are suggested retail. Please call vendors for information on availability.

HARDWARE

Dual-Mode Trinitron Display

Monitor that provides single-page and two-page 19-inch and 21-inch display modes. Compatible with Apple Macintosh standards. $4200. SuperMac, 408/245-2202.



Dual-Mode Trinitron Display

Gold Card

Data-compression coprocessor for the Mac II series.

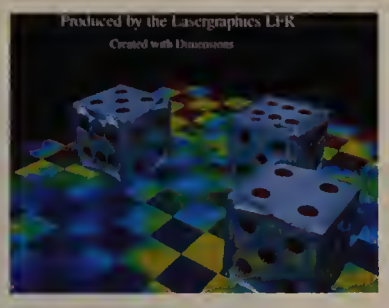


Gold Card

Performs real-time data compression at rates of more than 600K per second and decompression at over 1MB per second. $395. Pinnacle Micro, 714/727-3300, 800/553-7070.

LFR Plus Film Recorder

A 33-bit color film recorder that can be shared through AppleTalk. Provides an automatic film-advance and film-out indicator to minimize operator intervention; comes standard with automatic exposure calibration. $13,750. Lasergraphics, 714/727-2651.



LFR Plus Film Recorder Output

The Lock Box

Macintosh security system that provides manual key lock of mouse and keyboard, autostart for Mac II systems once power is restored after a power failure, remote lock and unlock of mouse and keyboard from a user-provided switch to prevent unauthorized use, and remote start of Mac II systems from a switch. Lock Box contains ADB connectors for the keyboard and mouse, and two screw terminal connectors for remote switches. $99. The Lock Box, 408/685-1000.

MacStretch

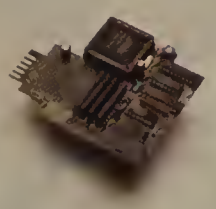
Memory-expansion board for the Mac Classic that has 1MB of RAM on the board and two SIMM sockets. Contains a function socket for expanding the capabilities of the Classic. Board plugs into the dedicated memory slot on the logic board. $139. Computer Care, 612/371-0061, 800/950-2273.



MacStretch

Publisher Classic

Monochrome interface board for Mac Classic that can be connected to Generation Systems' 15" One-Page Display or 19" Two Page Display for large-screen viewing or to Apple's 15" Portrait or 21" Landscape monitors. $399. Generation Systems, 408/734-2100.



Publisher Classic

Radius Pivot for Built-In Video

Pivot display that is compatible with Mac IIsi's and IIci's built-in video display interface. Does not require additional video interface card. $1295. Radius, 408/434-1010.



Radius Pivot for Built-In Video

WTI-VideoMax

Converter for recording Macintosh-generated video on consumer and professional videotape-recording equipment. Enables user to record live video from any Mac II computer that has an Apple-compatible display board capable of generating NTSC/PAL signal timing. Connects to the output of the display board and provides output connections for NTSC/PAL composite, S-Video, and RGB signals.
(continues)



WTI-VideoMax

$375. Workstation Technologies, 714/250-8983.

SOFTWARE

4D Write

Word processing module designed for integration into 4th Dimension. Provides word processing capabilities, document processing, basic database publishing, document tracking, hot links with other modules, and procedural control between 4D Write and 4th Dimension. 1MB min. memory. $295. ACIUS, 408/252-4444.

AppSizer

Utility for managing application memory sizes under MultiFinder. Supports System 7.0 and the ability to make memory-partition size changes permanent. Has built-in help. Available as shareware; upgradable for current Memorysetter users. 1MB min. memory. Upgrade from Memorysetter $14.95; shareware version $19.95; with disk and documentation $24.95; site license available. Peirce Software, 408/244-6554.

Bridges

Interactive color-publishing tutorial that runs on the Mac II and later models. Designed to familiarize desktop publishers with electronic color. Contains sections on color theory, electronic images, and prepress and printing methods. 4MB min. memory. $39.95. Pre-Press Technologies, 619/931-2695.

Computer Comfort

Book and HyperCard stack written as a guide to advise computer users on best ways to help prevent computer-related repetitive



Computer Comfort

strain injuries. Discusses causes of strain and suggests remedies. details ways of setting up work environment for comfort, and illustrates stretches to relax the muscles while using the computer. Written by Melissa Mayfield. 1MB min. memory. Book $8.50; software $25. Computer Comfort, 1117 Woodland Ave., Menlo Park, CA 94025.

Down to Earth

CD ROM that contains more than 750 high-resolution color and monochrome PICT images ready for use in desktop presentations, desktop publishing, and education. Contains a picture inventory of included line drawings and scanned photographs, focusing on environmental impact, foliage, food, landscapes, sky, and the marine environment. 1MB min. memory. $249. Wayzata Technology, 612/447-7321, 800/735-7321.



Down to Earth

DynoPage

Printing software that enables user to print Mac files to personal organizer pages or other page sizes. Can be turned on and off from Control Panel or from



within an application. 1MB min. memory. $79. Portfolio Systems, 914/876-7744.

Events & Holiday Cartoons

Collection of 100 bit-mapped cartoons. Images are designed with a humorous touch and include scenes from the Fourth of July, white-water rafting trips, Christmas, Hanukkah, Thanksgiving, Easter, Halloween, and New Year's Eve, and for events such as parties, graduations, and elections. 1MB min. memory. $49.95. T/Maker Company, 415/962-0195.



Events & Holiday Cartoons

Finger Helper

Designed to tutor students in American Sign Language. Divided into three parts: one teaches hand and finger positions for corresponding letters, one tests the student's ability to use ASL, and a game pits the student against a clock for speed and accuracy in reading finger letters. 1MB min. memory. $19.95. Software Solutions Unlimited, 408/741-9054.

FolderBolt

Security software that enables user to lock and unlock Mac folders. Folders may be completely secured, designated for read-only access, or password-protected. User can arrange for sets of folders to be unlocked as a unit when groups of items are to be used simultaneously. 1MB min. memory. $129.95. Kent Marsh, 713/623-8618, 800/325-3587.

FontMonger

A type-conversion and modification product that provides type format conversion in any direction between PostScript Type 1 and Type 3 fonts and TrueType fonts. Type can be converted to Adobe Illustrator or EPS language files. Lets user combine characters from various type families into one font and create inferior and superior characters for mathematical and scientific equations, pricing, and fractions. 1MB min. memory. $99.95. Ares Software, 415/578-9090.



FontMonger

GeneWorks

A DNA- and protein-sequence analysis program that uses a graphic interface to let researchers view linear sequence data as text or graphics, maps, plots, and graphs. A palette of drawing and editing tools and a set of formatting options let user customize color and black-and-white output for publication and presentation. Has scaling feature and can save graphics in PICT format. 2MB min. memory. For commercial users $3330; academic users $2350. IntelliGenetics, 415/962-7300.

Hard Disk Toolkit

Software package that replaces the disk drive's

(continues)


Actual
S.V. image



Actual
S.V. images

Sure, you're into computers, but how do you get your dog, or your house, or your
mpany into one? A Canon Still Video Imaging Kit may provide your answer.
As easy as taking a snapshot, it lets you convert any three-dimensional
ject into a digitized image, ready for use in programs like PageMaker,™
uark,® Photoshop™ and Persuasion.™
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Circle 164 on reader service card.

original installer software with a formatter utility package. Collection of five programs includes SCSI partitioning with password protection, historical diagnostics, drive microcode optimization, and benchmark analysis. 1MB min. memory. $199.95. FWB, 415/474-8055.

HyperCard 2.0 Development Kit

Collection of software, documentation, sample stacks, and tools for use with HyperCard. Includes five floppy disks containing stacks, tools, fields, and templates. 1MB min. memory. $199. Claris, 408/987-7000.

Instant Library of Quotations

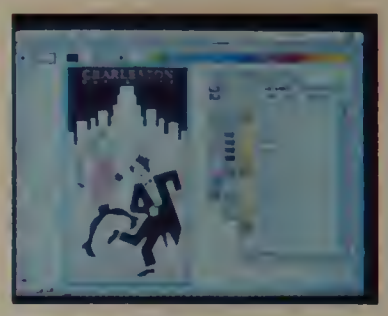
Reference work containing more than 5000 contemporary, literary, historical, humorous, and motivational quotations from a variety of writers, politicians, scientists, moralists, and humorists. Database is user-expandable and is cross-referenced and indexed by author. 1MB min. memory. $49.95. Nova Development, 818/992-3222.

Interactive Travel Encyclopaedia

First volume of an eight-volume travel encyclopedia geared toward travel agents, and available on CD ROM. Provides maps, photographs, text, graphics, animation, music, and voice to present various aspects of travel to different countries. Includes information about currency, passports, culture, and etiquette and a guide to hotels, restaurants, shopping, and entertainment. Subscribers get volume updates every six months. First volume covers 17 countries from Singapore to China, Japan, the Equatorial Far East, and the North Pacific. 5MB min. memory; requires a CD ROM player. $400; two-year subscription $500. Inter-Optica Publishing, 1213-1218 Shui On Centre, 6-8 Harbour Road, Hong Kong.

MacDraw Pro

Draw package that supports creating and editing colors and gradients. Has file-exchange capabilities with Claris XTND architecture, tools for greater control over text and graphics, and on-screen slide-presentation capabilities. 1MB min. memory for black-and-white machines, 2MB for 256 colors, and 4MB for more colors. $399; upgrade from MacDraw or MacDraw II $99. Claris, 408/987-7000.



MacDraw Pro

MacSunrise Script

Program for learning to read and write Japanese. Teaches stroke order and common compounds for kanji characters; uses voice function to teach pronunciation. Enables user to make kanji cards and posters. 1MB min. memory. Beginner $99; intermediate $249; advanced $499. Stone Bridge Press, 415/524-8732.

Mariah

Multimedia-management software that enables the user to organize graphics,

(continues)

Incredible Accounting Software



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"In the last two years, M.Y.O.B. has received two Eddy-award nominations. As accounting programs go, it packs more punch per dollar than almost any other system on the market. What makes the program different is that it combines the functionality experienced accountants expect with the ease of use that novices demand. M.Y.O.B. is a solid, double-entry accounting system that can work in any small business."

Circle 76 on reader service card. ★★★★½ MacUser April 1991

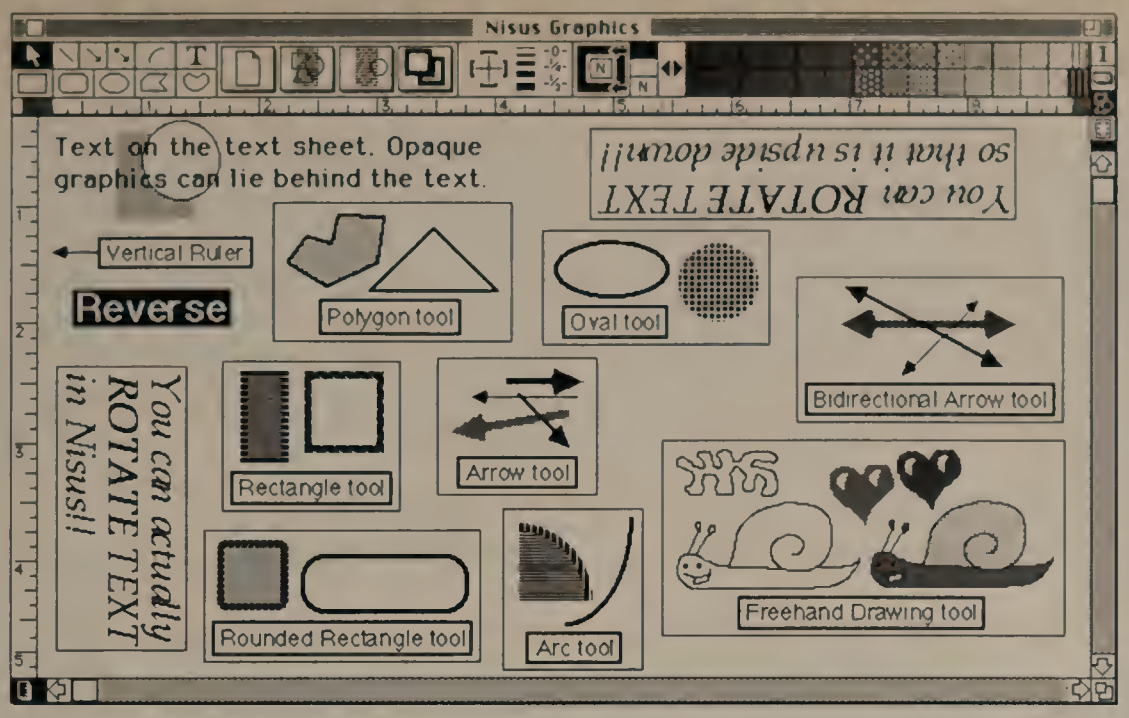
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If a picture is worth a thousand words, then why not use a word processor that processes pictures too?

Nisus® lets you communicate the way the Macintosh works—with words and graphics

Most people aren't really interested in whether a program is a word processor, a graphics program, or a page layout program. All they really want to do is communicate.

Sometimes, something as simple as a note with an arrow attached is all you need to make your point.

Nisus lets you draw attention to electronic symbols or scientific notation. Text wraps around your callout box automatically.

Other times, a little grey background behind some text seems more appropriate. The tools you need to communicate come built into Nisus, or you can place a PICT graphic like the features list on the right.

You can "Place" any page of a Nisus file containing text and graphics into another Nisus file where it becomes a picture called a "Placed Page Graphic." Double clicking this "Placed Page Graphic" will open the original file for editing. Graphics can be drawn or pasted to three different layers: the text layer, behind the text, and in front of the text, giving you total control.

Nisus lets you rotate text, which is very important if you are designing a self-mailer that folds into three panels. Nisus also enables you to print two pages up—pamphlet style. So, for example, suppose you want to print two pages on a single 8 $\frac{1}{2}$ by 11-inch sheet of paper turned sideways. You can do it with Nisus by a simple selection. Perhaps more important, however, is that this same command will collate your pages—in an 8 page document, for example, page 1 and page 8 will lie next to each other!

CIRCUIT DIAGRAMS IN A NISUS® DOCUMENT

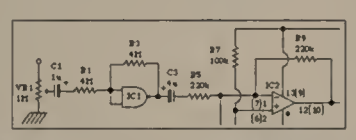


FIGURE 1A

This is a Laser TechFonts¹ diagram. As you can see, you can put a complicated diagram directly into your document. In this case, the diagram was drawn using specialized "draw" circuit fonts, along with the Scientific text fonts. These special fonts allow you to design a schematic quickly.

sing a draw or paint program, or a word processor with integrated graphics, such as Nisus®, the amazing word processor from Paragon Concepts, Inc.

SCIENTIFIC EQUATIONS WITHIN A NISUS® DOCUMENT

This is a section of Laser TechFonts¹ within a Nisus document $\frac{1}{2}x^{\frac{3}{2}}(x^2-x)^3$ The first part of the equation, $\frac{1}{2}x^{\frac{3}{2}}$, is an example of the Fraction font, which allows a fraction to be typed on one line of text The exponent 2 in the numerator is Fraction superscripted The second part of the equation, $(x^2-x)^3$, is an example of the Scientific font, with the exponents 2 and 3 in the SuperScientific font

You can type equations into Nisus using Laser TechFonts, and then put boxes around them These boxes, drawn using the Nisus graphics palette, call attention to examples and formulas This feature is perfect for writing manuscripts, exams and study guides

$$\beta = \frac{\sigma_m}{\sigma_x^2} = \frac{\sum_{i=1}^{n} X_i Y_i - k\left(\sum_{i=1}^{n} X_i\right)\left(\sum_{i=1}^{n} Y_i\right)}{\sum_{i=1}^{n} X_i Y_i - k\left(\sum_{i=1}^{n} X_i\right)}$$

FIGURE 1

If you're new to the Macintosh word processing market, you probably want a word processor that is easy to use. If you've been around for a while, you undoubtedly want a powerful word processor. Chances are you have tried either MacWrite or Microsoft Word. 4.0. One is easy to use, the other offers power. Both, however, have severe limitations which is why we developed Nisus in the first place.

Nisus has a built-in word processing language which does for word processing what built-in languages do for databases. For example, the language allows you to develop routines to index all proper names, a method to find and correct all double words, periods, and extra spaces, or index every word in a document except those you specifically want to exclude. You choose the features.

Discover why Nisus is shipped with every Macintosh in Korea, why *MacUser U.K.* named Nisus "1989 Best Word Processor," and why *Macworld Australia* uses Nisus as its word processor of choice.

This two column format above is actually a separate Nisus file placed into the master file. This gives you total control over how you layout a Nisus document.

Nisus Feature Comparisons	NISUS 3.0	Word 4.0	WriteNow	MacWrite II
Built-in word processing language (GREP & macros)	■			
Noncontiguous text selection	■			
Unlimited column formats	■			
Find and replace or index	■			
Find any font, *style*, SIZE, or color	■			▩
Place text or graphic linked to parent text or graphic file	■			
Find and replace in unopened files	■			
Cross reference text	■			
125,000+ user definable key commands	■			
"Super Style sheets"	■			
Automatic File Comparison	■			
10 editable clipboards	■			
Mark text as electronic book mark	■			
Built-in Graphics	■			
Rotate text and graphics	■			
Unlimited undos back to "open file"	■		▩	
Reads and Writes Microsoft Word Files	■	■	■	■
Vertical Ruler	■			

▩ Limited implementation

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Call today for your free complete brochure describing Nisus in detail. And while you're at it, ask yourself how many more words this ad—created in Nisus—would have taken without the pictures.

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(619) 481-1477

Nisus is a registered trademark of Paragon Concepts, Inc Other tradenames are trademarks of their respective companies

Circle 253 on reader service card

sounds, animation, and text. Acts as a storage-and-retrieval system for archiving mixed media and for organizing images, sounds, and text so that they can be cut and pasted to other applications or can be exported as individual files. Keyword window provides item information. 1MB min. memory. $149. Symmetry, 602/998-9106.

Mosaic for Macintosh

Software that enables Mac users to print documents from any application on HP LaserJet and DeskJet printers attached to a Novell network. Enables Mac computers to spool to both PostScript and PCL-based printers and includes a version of Novell's NetWare Desk Accessory utility that provides network supervisors with information about print jobs and lets them hold or delete jobs that have been submitted to the file server. 1MB min. memory. Three users $395; ten users $595. Insight Development, 415/652-4115.

Once Upon a Time . . . Creative Writing Series

Programs that teach children to create and publish illustrated books. Helps children to develop their writing, reading, and vocabulary skills while they learn concepts of story creation and illustration. Uses digitized sounds, color, and sound-input capability. Three volumes available. 1MB min. memory. $49.95. Compu-Teach, 203/777-7738.



Once Upon a Time

PageMaker 4.0: Introduction Level 1 and Level 2

Training materials for PageMaker 4.0. The course is sold as a starter package and includes instructor notes, color overheads, 12 student manuals, and data disks containing sample files. 1MB min. memory. Kit $900; additional student manuals $26 each. Logical Operations, 716/482-7700, 800/456-4677.

Peacock

Import/export utility that lets user move information, via text files, back and forth between a HyperCard stack and other text sources such as other HyperCard stacks, other applications, or other computers. Runs on any Mac that runs HyperCard 2.0 (included). 1MB min. memory. $69. Cyan, 509/238-6789.

Performance Mentor 2.0

Software that acts as a management adviser. Designed to guide corporate managers on daily employee-management issues from coaching and setting objectives to performance feedback and appraisals. Based on data culled from more than 300 research studies. Takes into account various current theories of management. All advice, tips, and hints may be printed. 1MB min. memory. $395. Performance Mentor, 415/969-4500.

(continues)

PHOTOREALISM



*Artist: Jon Watson image modified and rendered entirely in StrataVision 3d.

StrataVision 3d is realistically the best 3D program on the Mac. ● Already donned with industry awards, there's even greater power with version 2.0. Extended modeling gives you more control over objects. Apply realistic textures, set reflectivity and soften shadows with improved ease. Animations of linked objects offer stunning results. StrataVision 3d 2.0 also has a realistic price: less than $699. ● Whether you're an illustrator, a designer or a tinkerer, we have the realistic solution. Call toll-free 1-800-869-6855 today.



STRATA
The Virtual Studio Company.
Strata, Inc. | 2 West St. George Blvd., Suite 2100 | St. [illegible]
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*StrataVision 3d created the NBC [illegible] awards. StrataVision [illegible]

Circle 93 on reader service card.

Controlling your computer by voice is a science-fiction fantasy that has finally become reality." MacWeeks' Bob LeVitus goes on to say:

"HIGHEST 'WOW' FACTOR OF ANY PERIPHERAL WE'VE SEEN"

"With Voice Navigator II, your Mac will obey your every command; all you have to do is ask ...you can't help being delighted when you see it responding to its master's voice. If that sounds sexy to you, it is." -**MacWEEK** *10/9/90*

Just say "Open, Close, Print, Zoom, etc..." Voice Navigator II responds as quickly as you speak. Really.

It works so well that our technology won MacUser's 'Most Significant Hardware Product of the Year 1989'. **"WE WERE AMAZED"** -**MacUser** *3/90*

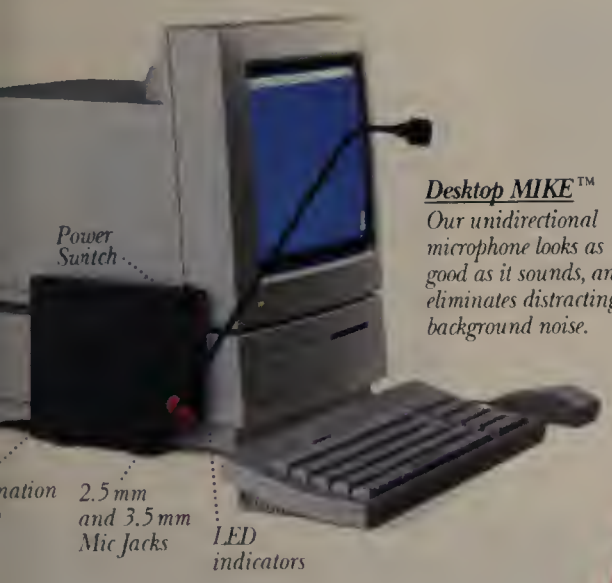
Now imagine PageMaker, Word, Excel, FileMaker, MacDraw, all of your favorite applications running ***Up to 50% faster***! So the next time you're next to a Macintosh, be careful what you say - it may be listening!

for more information call toll free 1-800-443-7077

MacUser Editor's Choice Award



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VOICE NAVIGATOR II

Articulate Systems
the voice communication company

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Circle 74 on reader service card

Rendezvous-Plus

An electronic appointment diary. Acts as a time organizer that can help you keep track of details including telephone numbers and scheduling of appointments. 512K min. memory. $249. PMC Telesystems, 604/255-0049.

Tattoo

Registry service based on a patented marking system that permanently imprints an identification number and an 800 telephone number on a computer. Once someone notifies S.T.O.P. that a computer has been stolen, the company places the ID number on a blacklist that is transmitted to law-enforcement authorities and major computer resellers. Kit comes with all elements needed for installation. Can be installed at home or by S.T.O.P. personnel or resellers. 1MB min. memory. Single-machine kit $60; peripherals kit $30; quantity discounts available. S.T.O.P., 213/359-9361, 800/488-7867.



Tattoo

Thexder

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Line Conditioner

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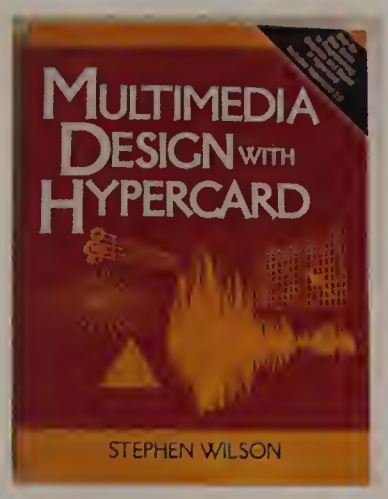
Book of hints and ideas for using the Mac; System 7.0; and a variety of applications such as word processing, spreadsheets, graphics, communications, and desktop publishing. Tells how to recover disk space; cut down on lost printing time; do troubleshooting and monitor repairs; edit fonts; customize menus; and print envelopes, labels, and pages. Written by *Macworld* contributing editor Lon Poole. $24.95. Microsoft Press, 206/882-8080.



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Circle 52 on reader service card

Quick Tips

Mailing disks, publishing FileMaker databases, and more

BY LON POOLE



Postal workers cringe when they hear of people sending disks through the mail in regular envelopes (as a tip last August suggested doing). According to one U.S. Postal Service electronic technician in San Diego—whose many duties include removing mail jams from automated letter-sorting machines—not a night goes by that he doesn't see damaged items loose in the automated mail machines. "You cannot expect to mail small items such as nuts, pens, rings, or computer disks in regular envelopes. They will not make it through the 180-degree turns or pinch rollers in the machines." Because the USPS is tight-lipped about this problem, he requested anonymity lest the agency take action against him for going public.

He recommends using disk mailers and padding them so they are over ¼-inch thick when mailed—the chunkier the better. Items this size are culled out before they get to the automated equipment and are sorted by hand. He also notes, "It does little good to mark the outside of the envelope with *Hand Stamp*, as most of our machines can't read."

More Hard Drive Confusion

When you have two or more SCSI hard drives, each with a System Folder, you should be able to select whichever one you want as start-up disk in the Startup Device section of the Control Panel. (I explained how in an answer in March.) But Owen Rubin of Cupertino, California, wrote to remind me that the Mac may skip the SCSI drive you designate because that drive doesn't become ready soon enough. If another SCSI drive (with a System Folder) is ready much sooner, the Mac always starts from it instead.

If setting Startup Device in the Control Panel does work for you but you occasionally want to start up from another disk, press ⌘-shift-option-delete when you start up or restart the Mac. (You may have to use a pencil in your teeth as a third hand to press the delete key.) After a few seconds a disk icon with a flashing question mark appears. Release the keys, and the Mac starts up from the first SCSI drive (with a System Folder) it finds. This trick doesn't work on a Mac Plus or any earlier models.

Correction

An earlier tip (February 1991) explained why the LaserWriter II's red manual-feed light often stays on after printing ends and recommended a workaround. In editing the tip, I added a comment that the manual-feed light can also indicate a paper jam, when what I meant to say was *paper out*. A separate light indicates a paper jam.

ResEdit Revealed

Q I have read about the program ResEdit many times in your column. What exactly does it do and where can I get it?

Zach Babayco
Sacramento, California

A Apple Computer made ResEdit for software developers to create and modify icons, dialog boxes, menus, and other resources in their programs. Ordinary folks like you and me can roll up their sleeves and use ResEdit to change those resources and fonts, patterns, pointers, date and currency formats, and more in application programs and in system software. (For more details on customizing the look and sound of your Mac, see "Getting Started with Resource Editing," in this issue.)

Apple's ResEdit reference manual is distributed without the program by Addison-Wesley through bookstores for $12.95 list. However, ResEdit does come with *ResEdit Complete* (Addison-Wesley, 1991). You can also get the program from most user groups that have software libraries. At this writing, for example, both BMUG (415/549-2684) and BCS•Mac (617/625-7080) have prerelease version 2.0b2 for $4 ($10 from BCS•Mac for nonmembers). BMUG also has a ResEdit book, *Zen and the Art of Resource Editing*, that lists for $20.

(continues)



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You can also get the latest version from the Apple Programmer's and Developer's Association (APDA), Apple's mail-order distribution service for technical customers. To buy pre-release versions of products from APDA, you must be a subscriber. This involves completing and signing forms and paying an annual fee of $20 in the U.S., $25 in Canada, or $35 for residents of all other countries. You won't have to be a subscriber to buy ResEdit 2.1 when it becomes available (probably this spring). APDA sells ResEdit for $17 and the manual for $12.95.

Eight Ball in the Corner

TIP: Style is everything, especially for Macintosh users. If you use a Turbo Mouse trackball instead of a mouse, you can buy a Custom Trackball for it from Kensington Microware ($12.95; comes in four colors). I say customize it yourself. I replaced my drab beige-color trackball with an actual billiard ball (the eight ball, to be exact). It is about a millimeter under in diameter, but the extra weight keeps it firmly in place. I have been using it now for months without any failure. This tip will not improve throughput speeds or increase storage, but it does wonders for improving one's attitude.

Patrick M. Pagano
New York, New York

Cancel Dragging

TIP: Want to cancel dragging of icons or a window in the Finder? Before releasing the mouse button, move the pointer into the menu bar.

Ruth Spradlin
Oakland, California

Calculated Publishing

TIP: The recent article "Publish Your Database" (February 1991) was very useful for the beginning database publisher, but I disagree with author Jim Heid's claim that FileMaker can't export tagged text files because it lacks a programming language. I use FileMaker's calculation fields to create style-tagged text files that PageMaker 4 can import as fully formatted text. This technique works with FileMaker Pro and FileMaker II.

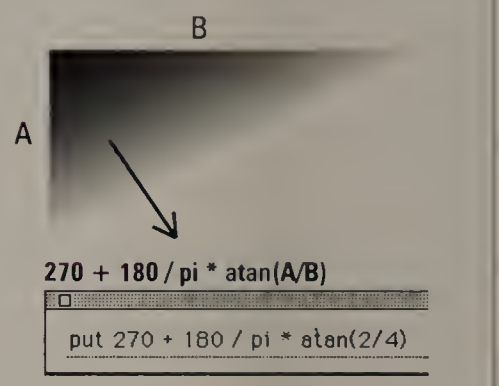
The fields in the FileMaker database contain the text you want to

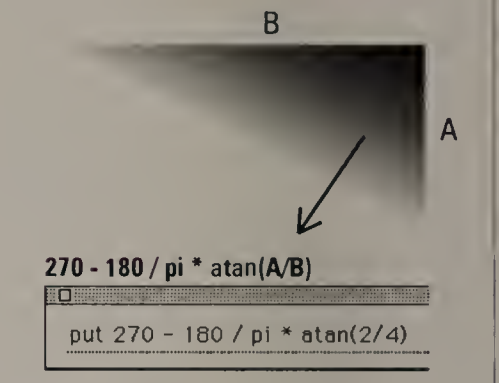
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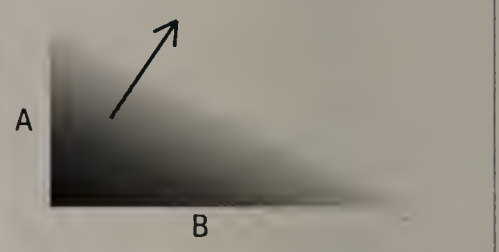
Diagonal Gradient

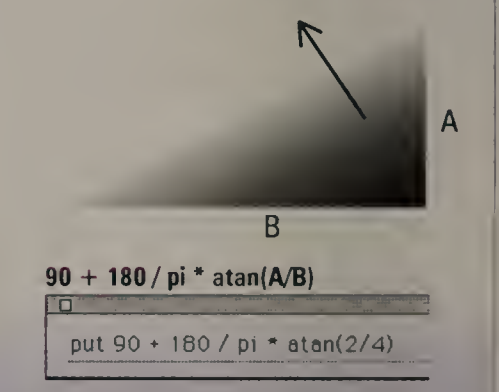
Have you ever wondered how to figure out the angle for those nifty little diagonal gradients? You can use a calculator with trig functions or have HyperCard figure it out for you, like Bob Weber of Cape May, New Jersey, has done.

In HyperCard's message box just type `Put` followed by one of the formulas shown below; then press Return. (Substitute the lengths of the sides of the object you're filling where you see *A* and *B* in these formulas.) HyperCard displays the angle measurement in the message box.









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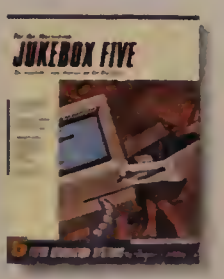


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publish. As an example, suppose you publish a simple catalog listing products, descriptions, order numbers, and prices. This database contains four fields: Product, Description, OrderNumber, and Price. "Published Database" illustrates the database and the catalog to be produced from it.

You create a blank PageMaker publication for the catalog, and in it you define a style for each paragraph of the product listing. For the example, you need three styles: Product, Description, and OrderPrice. (The order number and price are in the same paragraph.)

Next you must create the calculation fields that put the text from the FileMaker database into a form that includes a PageMaker style name in angle brackets at the beginning of each paragraph. PageMaker interprets these style tags as style names when it imports text.

To create calculation fields, use FileMaker Pro's Define Fields command (Style menu) or FileMaker II's Define command (Style menu). Each time you create a calculation field, FileMaker displays a dialog box in which you enter a formula that tells FileMaker how to calculate the result, and then you specify the type of result you want. Set the calculation result to Text for all fields you're exporting for publication.

For the example catalog, you would create three new calculation fields with the names TagProduct, TagDescription, and TagOrderPrice. The formula for the TagProduct field looks like this:

```
"<Product>" & Product
```

The formula for the TagDescription field is similar:

```
"<Description>" & Description
```

The formula for the TagOrderPrice field combines the order number with the price, putting both in the same paragraph of the catalog:

```
"<OrderPrice>" & "(" & OrderNumber & ") $" & NumToText (Price)
```

Notice this formula puts the order number in parentheses, prefixes the price with a dollar sign, and converts the price from a numeric value to text. Without that conversion, FileMaker reports an error in the formula.

You can check the results of the formulas before exporting. Use FileMaker's Browse command (Select menu) with a layout that shows the calculation fields. "Published Database" shows the results of the calculation fields for the example database.

When you are ready to export tagged text, use FileMaker Pro's Export command (File menu) or FileMaker II's Output To command (File menu). You have to specify the name, folder location, and type—Tab-Separated Text for FileMaker Pro, Text File (Tabs) for FileMaker II—of the style-tagged text file. In addition, you specify which fields you want to export and in what order. For the example database, you would select TagProduct, TagDescription, and TagOrderPrice, in that order.

Before placing the file in PageMaker, you must replace the tabs that FileMaker puts between fields with returns, so each field becomes a separate paragraph. Use a word processor to open the style-tagged text file and change all the tabs to returns. In Microsoft Word, for example, use the Change command (Utilities menu) to change all instances of ^t to ^p. Then save the file and quit the word processor.

Finally you are ready to place the style-tagged text file in the PageMaker publication in which you already defined styles corresponding to the tags. When you use PageMaker's Place command (File menu), be sure to set the Read Tags option. Within the Smart ASCII Filter dialog box that appears, set the No Conversions; Import As Is option. Then position the loaded text pointer where you want to flow the text, click, and you should see fully formatted text appear on the page, exactly as you specified it in your PageMaker definitions.

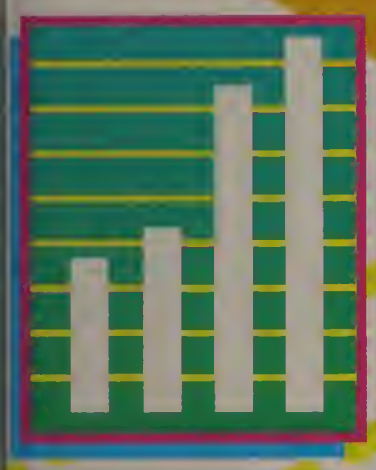
This may sound like a lot of work, but you set up the calculation fields and the style definitions only once. After that, publishing a new edition of the database is only a matter of exporting from FileMaker and placing in PageMaker. The only drawback I've

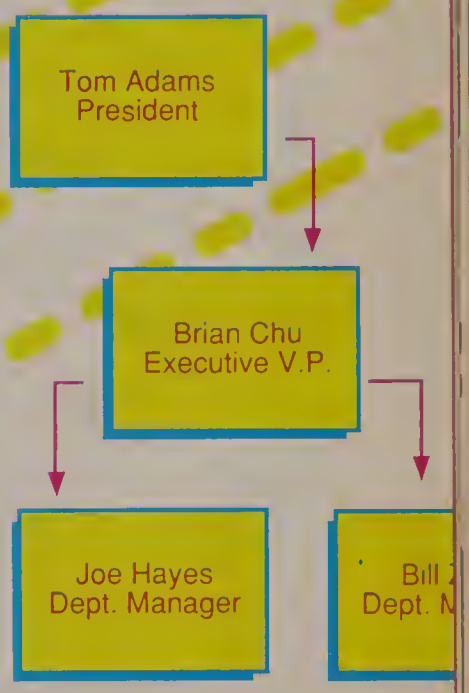
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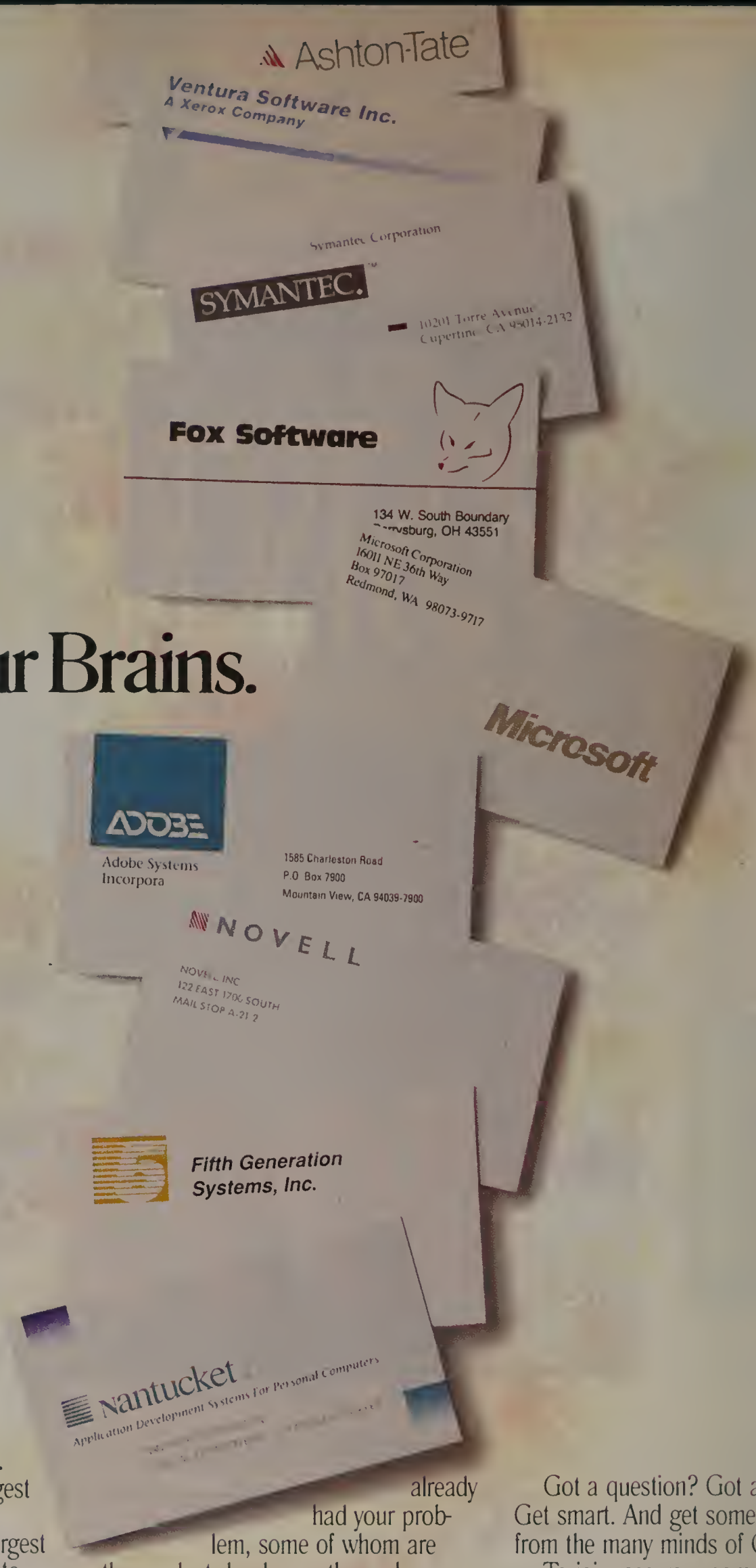
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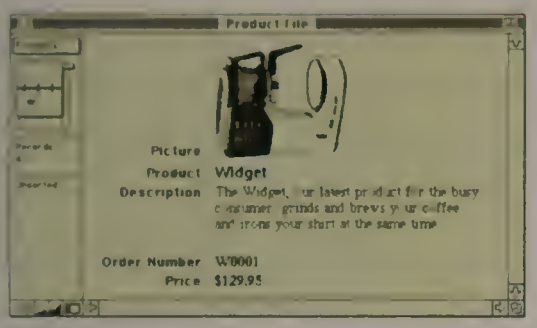
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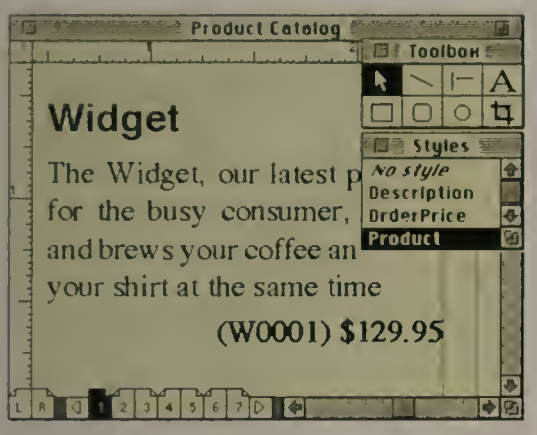
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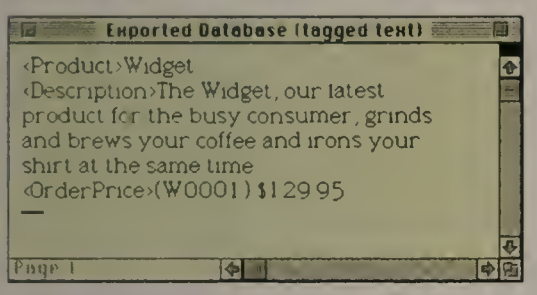
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PUBLISHED DATABASE **You can publish a FileMaker database (top) with full paragraph formatting in PageMaker (middle) by using calculation fields to embed style name tags in an exported text file (bottom).**

found (aside from the initial time to debug your procedure) is that the FileMaker database doubles in size, since you duplicate each field when you create the calculation fields containing the style tags.

Kirsten Robinson
Providence, Rhode Island

Also, FileMaker can't export picture fields or summary fields.—L.P.

Icon Lineup

TIP: I don't like using the ⌘ key to keep icons aligned while dragging them in Finder windows. Some names are longer than others, so either the names overlap or there is too much space between icons. Instead I resize the window (by dragging the size box at its lower-right corner) so that its horizontal scroll bar is just below the icon names I want to align. The scroll bar acts as a guideline along which I can line up the icon names.

Linda Jagiello
Los Angeles, California

Dusty Advice

TIP: As a VAX manager, I have run across dust-related failures before. When I opened my personal Mac II for the first time in almost two years to insert four new SIMMs, I was appalled at the dust accumulation. You or a competent service person should remove the dust from inside a fan-cooled Mac regularly. Dust does conduct current; it just takes a lot of it to do any damage.

In a dusty environment, cleaning every 3 to 6 months should do the trick. In a normal environment, try every 6 to 12 months.

Ron Williams
Fort Walton Beach, Florida

A layer of dust also acts as a blanket, causing components to run hotter than intended. Heat is the number-one enemy of electronics.

I don't recommend you clean your own Mac Plus, SE, SE/30, or Mac Classic. Their internal parts are too crowded together and easily damaged. Also, opening one of those Macs may invalidate its warranty.

To remove dust from other models, unplug the Mac and open it. Then use a soft-bristled brush to loosen the dirt and carefully suck it out with a home vacuum cleaner (preferably with a plastic nozzle). Be careful not to bump any internal parts with the vacuum or touch them with your hands. Pay particular attention to the disk drive of a IIcx or IIci because the cooling fan constantly sucks dirt through the drive. You can temporarily seal an empty disk drive with a $6.95 Duskette 3.5 from Venino Ventures (800/926-7577).—L.P. Ⓜ

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Lon Poole answers readers' questions and selects and edits their tips for this monthly column. You'll find all the best tips from six years of this column in his latest book, The Big Book of Amazing Mac Facts *(Microsoft Press, 1991).*

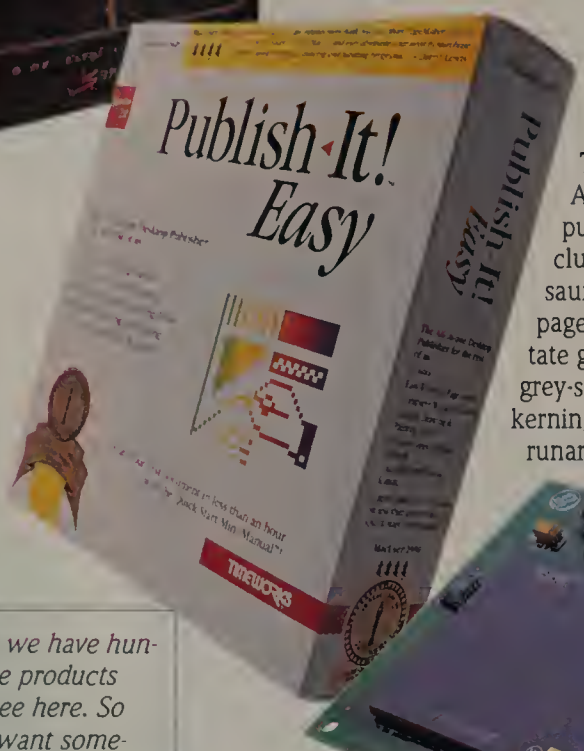


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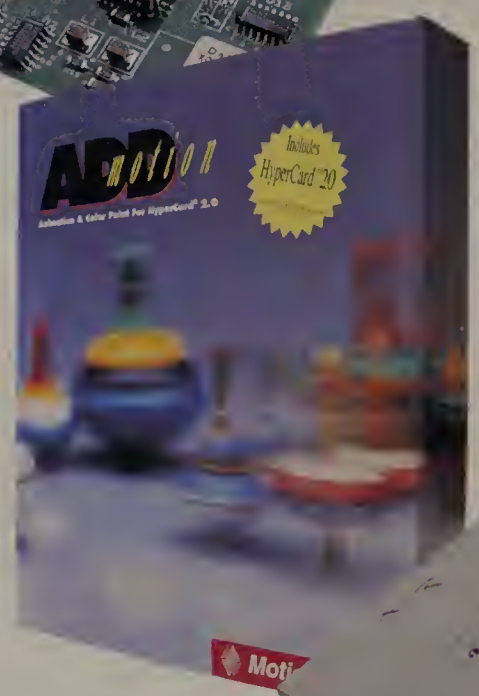
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Advanced Gravis
Mousestick ADB ..... 64.
Altra
Felix ..... 99.
American Power Conversion
UPS 110SE ..... 205.
UPS 370 CI ..... 325.
Apple
Toner/Laserwriter II ..... 105.
C-Enterprises
AB Box ..... 38.
ABCD Box (DIN-8) ..... 49.
Casio
CasioLink/Mac ..... 89.
B.O.S.S. SF-9500 ..... 245.
Fellowes
Copy Arm (Non-Magnetic) ..... 6.
Diskette Holder
Oak (Holds 45) 17
Oak (Holds 120) ..... 31.
Teak (Holds 45) ..... 18.
Teak (Holds 120) ..... 32.
Fan-File ..... 5.
Step Cube ..... 9.
Golden Ribbons
Imagewriter Multi Color ..... 9.
ImageWriter Ribbons - Black 4
Goldstein & Blair
Macintosh Bible 3.0 ..... 19.
Macintosh Bible W/Disk ..... 26.
I/O Design
MacLuggage
Ultimate Classic Black or Navy ..... 64.
Ultimate IIsi ..... 88.
Ultimate Neon-Pink, Yellow, or Green ..... 84.
Ultimate SE Black Or Navy ..... 79.
Kensington Microware
Apple Security Kit System ..... 33.
MacII Stand W/Exten.Cables ..... 64.
SE Radiation/Anti-Glare Filter ..... 52.
Tilt Swivel ..... 22.
Turbo Mouse Adb ..... 109.
Key tronic
Mac Pro Plus ..... 139.
Macs Place
7 Outlet Noise/Surge ..... 15.
Mac Tool Kit ..... 14.
Maxell
150Meg BU Tape CS600XD ..... 22.
60Meg BU Tape CS600HD ..... 18.
MSC Technologies
ADB Trackball ..... 69.
Little Mouse ..... 74.
Sharp
Wizard OZ-8200 128KB ..... Call
Sony Disks
High Density 10 Pak 16
HD-Bulk (Units Of 50) ..... ea 1.20
Double Sided 10 Pak 9
DD-Bulk (Units Of 50) ..... ea .65
Targus
Imagewriter Bag Black ..... 45.
Mac/SE Bag Black 54
Deluxe SE Extended Bag
Black,Navy,Gray,Wine ..... ea 68.

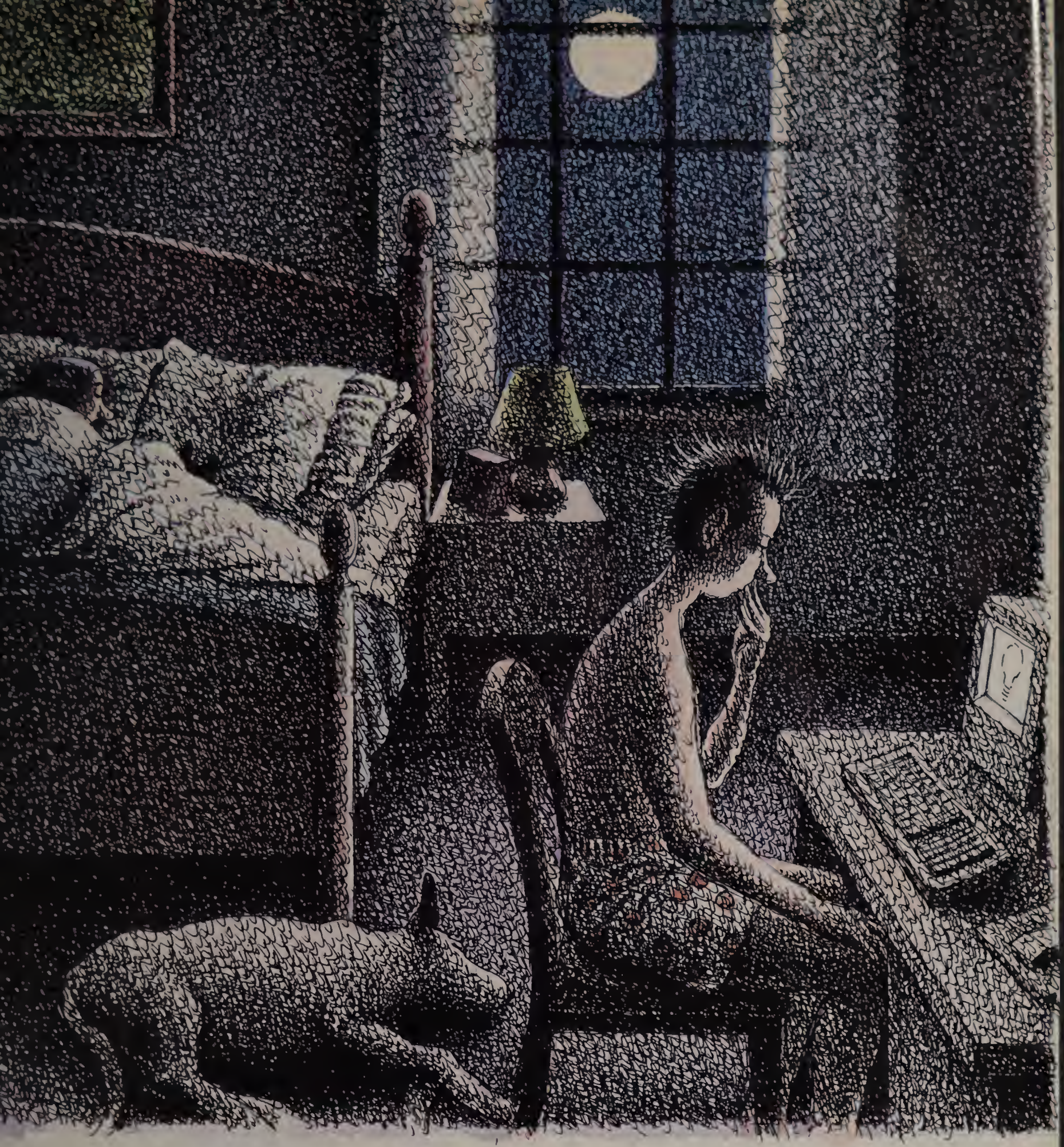
BUSINESS

A Lasting Impression
RésumExpert Series (All Titles) ... 42.
ACIUS
4th Dimension ..... 485.
File Force ..... 248.
Advanced Software
Docucomp ..... 87.
AEC Management Systems
FastTrack Schedule 1.5 ..... 135.
ASD Software Inc.
Planisoft ..... 138.
Ashton-Tate
Full Impact 2.0 ..... 149.
FullWrite Pro 1.5 149
Caere
OmniPage 529
CE Software
Quickmail (10 Users) 305
Quickmail (1-5 Users) ..... 215.
Chang Labs
C.A.T. III ..... 279.
CheckMark Software
Cash Ledger ..... 114.
MultiLedger 1.3 ..... 225.
Payroll ..... 169.
Chip Soft
Turbo Tax 55
Claris
FileMaker Pro 215
MacProject II ..... 365.
MacWrite II ..... 139.
CompuServe
Compuserve Navigator ..... 45.
Mac Starter Kit/w Info.Man. ..... 21.
DataViz
Maclink Plus PC 4.0 W/Cable ..... 118.
Maclink Translators ..... 98.

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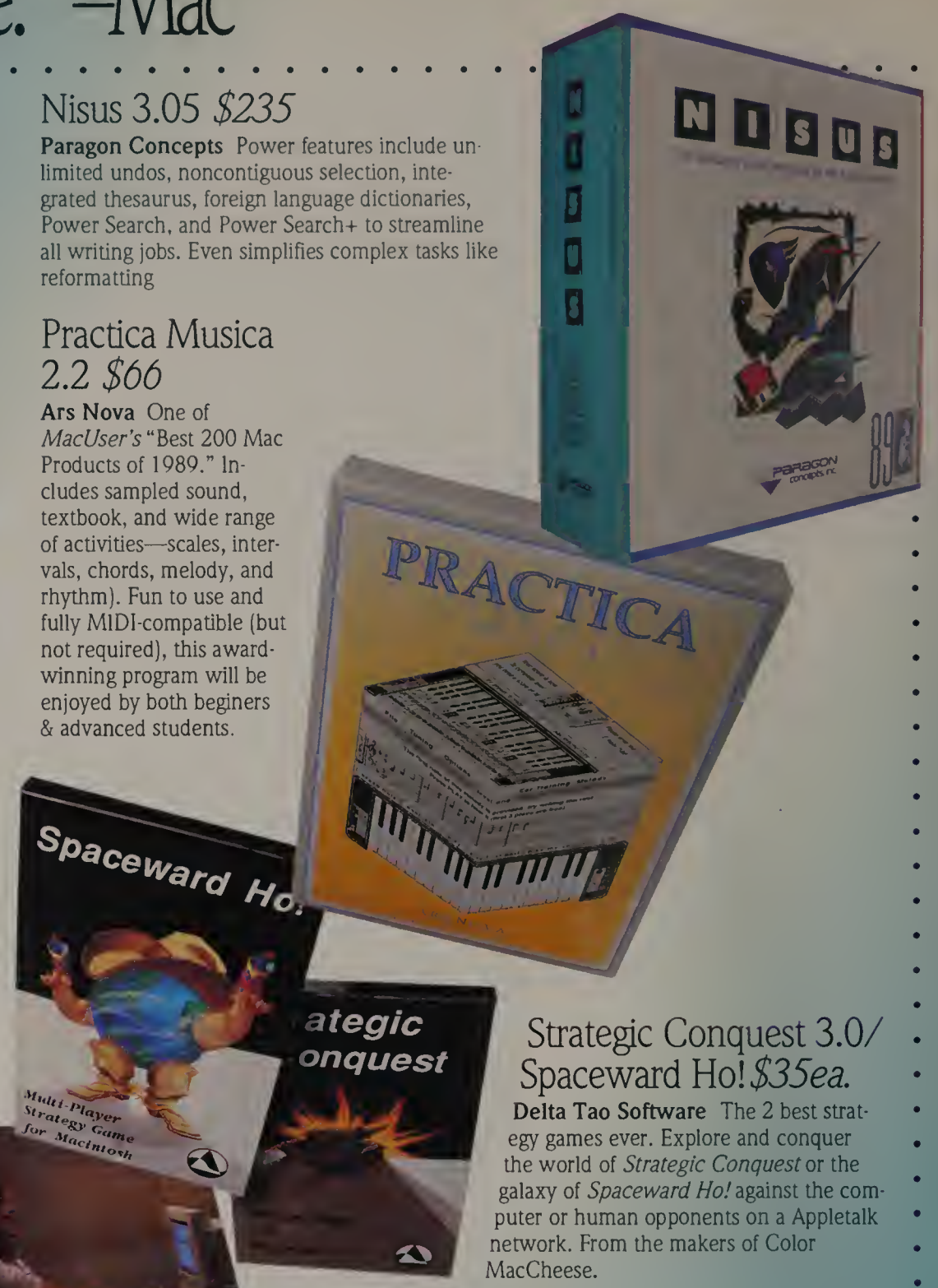
DeltaPoint
DeltaGraph 1.5 ... 109
Taste ... 84
Farallon
Timbuktu 3.1 (30 Pk) ... 1279
Timbuktu 3.1 One User ... 95.
Timbuktu 4.x ... Call
Timbuktu Remote 2.0 ... 123.
Fox Software
FoxBASE+/Mac ... 289.
FoxBASE+/Mac MultiUser ... 389
Franklin Software
Language Master ... 49.
Freesoft
White Knight V11 ... 83.
Great Plains Software
Plains & Simple ... 255.
Hayes
Smartcom II ... 83.
Insight Development
Macprint 1.2 ... 84.
Insignia Solutions
Access PC ... 81.
Soft PC ... 245.
SoftPC-AT/EGA Module ... 125.
International Business Software
Data Club 3 User ... 198.
Data Club 10 User ... 538.
Intuit
Quicken 1.5 ... 38.
MacShack Enterprises
MyTimeManager 3.0 ... 59.
Microsoft
Excel 2.2 ... 239.
Office ... 525.
PowerPoint ... 242.
Word 4.0 ... 239.
Nolo Press
Will Maker 4.0 ... 36.
Odesta
Double Helix Release 3.5 ... Call
Paragon Concepts
Nisus 3.05 ... 235.
Portfolio Systems
Dynodex Instant Address Book ... 59.
DynoPage 1.0 ... 62.
Prescience
Expressionist 2.07 ... 86.
Theorist ... 245.
Quark
XPress ... 519.
Reality Technology
Wealth Builder ... 98.
Reference Software
Grammatik Mac v.2 ... 49.
Sensible Software
Sensible Grammar ... 51.
Shana Corporation
Informed Auto Form ... 85.
Informed Designer ... 159.
Informed Mini Manager ... 54.
Softsync
Accountant Inc. ... 342.
Softview
Macintax Federal 1990 ... 64.
Software Ventures
Microphone II v4.0 ... Call
Solutions Inc.
Faxgate Plus ... 235.
Survivor Software
MacMoney 3.5 ... 58.
Symantec
More 3.0 ... 269.
Symmetry
Key Plan ... 239.
Systems Compatibility
Software Bridge ... 75.
T/Maker
WriteNow 2.2 ... 119.
Teleware
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Timeslips Corporation
TimeSlips III ... 167.
TimeSlips Accounting Link (TAL) . 52.

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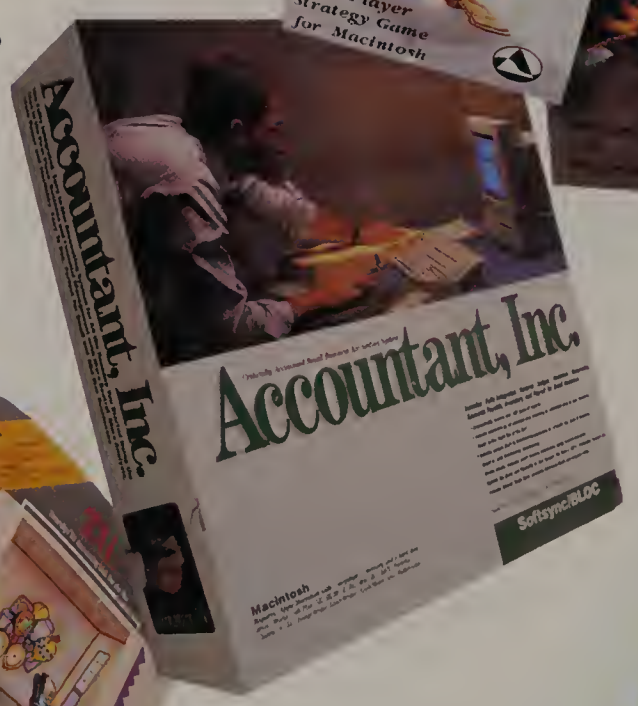


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Tops/Sitka
Tops 3.0 Network Bundle ... 186.
Traveling Software
Lap-Link Mac Connect. Pac ... 94.
Westware
Contact Ease ... 248.
WordPerfect Corp.
WordPerfect V2.0 ... 288.
Zedcor Inc
Desk ... 219.

CD ROM

Everex Systems
EMAC Metro CD ROM Drive ... 598.
NEC
Intersect CDR Interface KIT ... 60.
CDR-36 CD Rom Drive Port ... 498.
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Digidesign
Clip Tunes ... 152
Farallon
Media Tracks MM Pack CD ... 319.
FM Waves
Artware
Vol. 1-7 CD-ROM ... Call
HyperGlot Software
Learning To Speak French CD ... 62.
Learning To Speak Spanish CD ... 62.
M3
M3 CD ROM 1990 ... 88.
Microsoft
Office CD-ROM ... 599.
Passport Designs
DeskTop Music Creat. Kit CD ... 189
Pro Music Prod Kit CD ... 1249
Somak
Clip Art CD Vol. 1 or 2 ... 61
Wayzata Technology
Clip Art Masterpieces ... 88
Down To Earth ... 119
Quick Art ... 174

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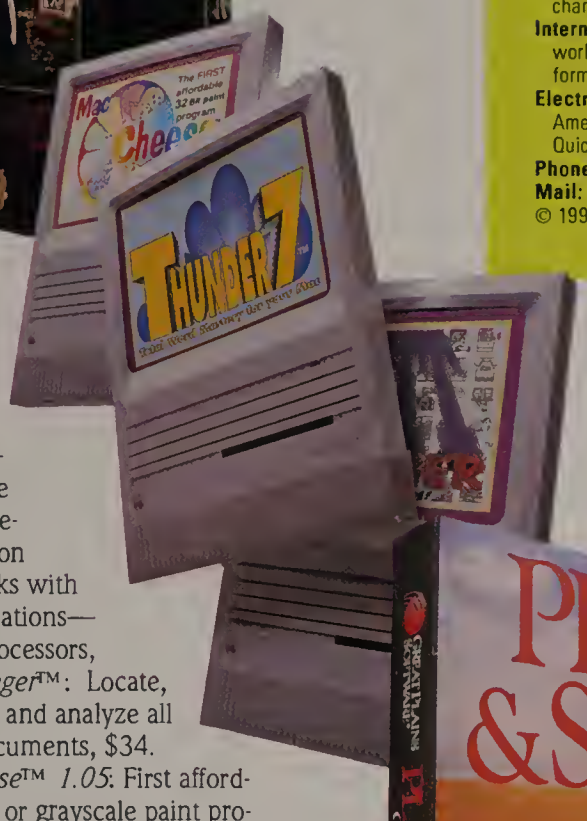
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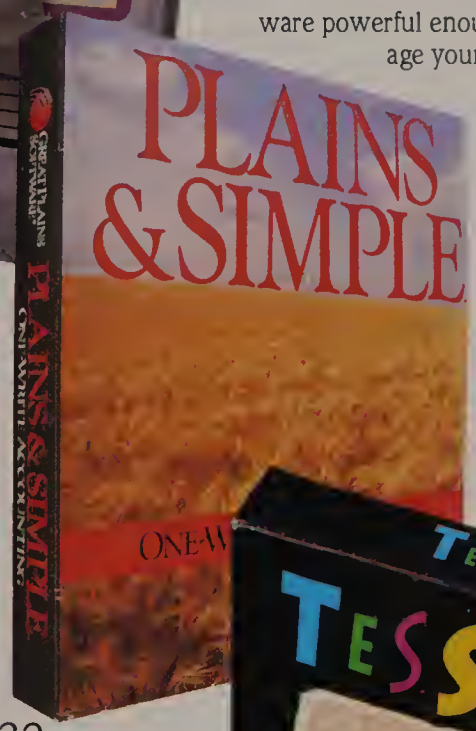
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- Type! ..... 18.

Carina
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Davidson & Associates
- Math Blaster ..... 28.

Great Wave Software
- Kidsmath ..... 28.
- Kidstime ..... 28.
- Number Maze ..... 28.
- Number Maze Deci. & Frac. ..... 28.

HyperGlot Software
- Easy Kana (Japan.) ..... 138.
- KanjiMaster-8eg (Japan.) ..... 98.
- *Pronunciation Tutor*
- French,German,Chinese ..... 39.
- Spanish ..... 34.
- *Verbal Tutor*
- Span.,Fr.,Ger. ..... 39.
- *Word Torture 4.0*
- Russ.,Span., Fr., Ger., Itl. ..... 33.

Knowledge Revolution
- Interactive Physics ..... 188.

Learning Company
- Math Rabbit ..... 31.
- Reader Rabbit 2.2 ..... 31.

MECC
- Word Munchers ..... 28.
- Number Munchers ..... 28.

Penton Overseas
- VocabuLearn/I & II Series ..... ea.34.

Personal Training Systems
- Modules for Excel 2.2, Hypercard 2.0, Word 4.0, Works 2.0, Freehand 3.0, Persuasion 2.0, Pagemaker 4.0, Filemaker Pro, Quark Xpress & the Mac ..... ea. 49.

Simon & Schuster
- Typing Tutor IV ..... 28.

Software Toolworks
- Mavis Beacon Typing ..... 32.

Visionary Software
- Lifeguard ..... 49.
- Synchronicity V2.5 ..... 36.

ENTERTAINMENT

Accolade
- Ishido: Way of the Stones ..... 35.
- Stratego ..... 35.
- Test Drive II The Duel ..... 34.

Activision
- Cosmic Osmo ..... 39.
- Manhole ..... 28.

Baseline Publishing
- Talking Moose ..... 22.

Broderbund
- Ancient Art Of War ..... 25.

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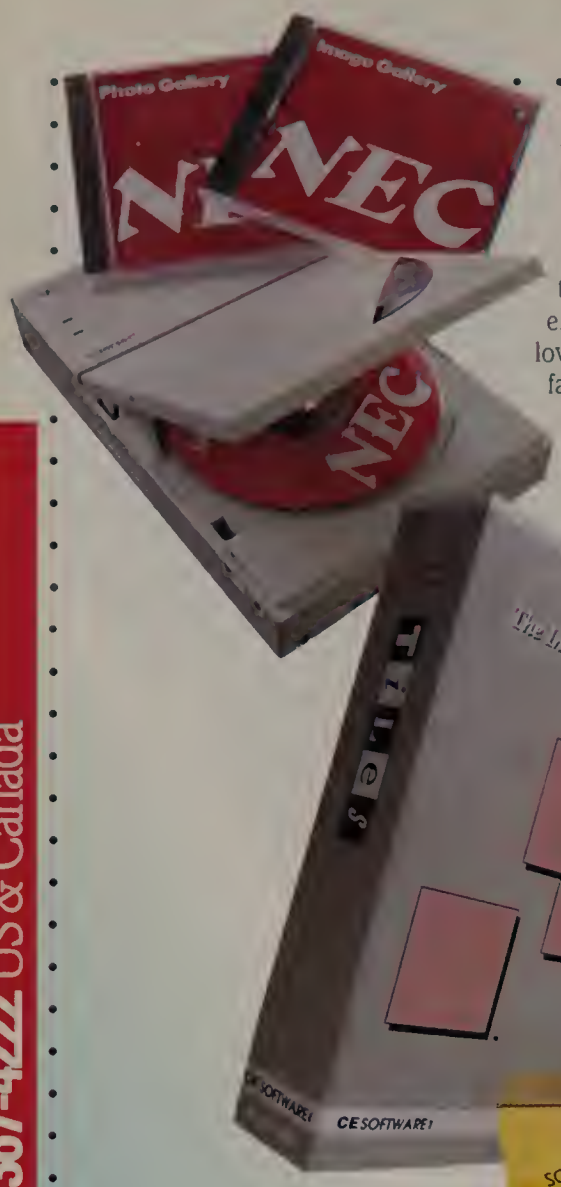
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- Faces 24
- Falcon 2.2 32
- PT-109 26
- Solitaire Royale 24
- Tetris 24
- Vette 32
- Welltris 24

Strategic Simulations, Inc.
- AO&D: Curse of the Azure Bonds 36
- AD&D: Pool Of Radiance 32.

Strategic Studies Group
- American Civil War Vol 2 28
- Gold of the Americas 3Call
- Halls Of Montezuma 28
- Panzer Battles 28
- Reach for the Stars 30.
- Rommel Battles for North Africa Call

Three Sixty
- Armor Alley 34
- Harpoon 39.
- Harpoon Battle Set #2 20.
- Sands Of Fire 32.

Toyogo, Inc.
- Go Junior 21.
- Nemesis Go Master 47.
- Go Master Deluxe 95.

XOR Corporation
- MacGolf Classic 4
- MacSki 3
- NFL Challenge 5
- TaskMaker 2

GRAPHICS

3G Graphics
Images W/Impact
- Accents 6
- Business 1 6
- Graphics & Symbol 4

Adobe
- ATM Plus Pack 10
- Collector's Edition II 12
- Illustrator 3.0 w/ATM 2.0 33
- Photoshop 48
- Smart Art 1-4 58ea
- Streamline 2.0 12
- Type Align 5
- Type Manager 5
- Type Reunion 3
- Type Set 1 or 2 5
- Type Set 3 11

Adobe Postscript Fonts
Call for Full Line Of Adobe PS Fonts
- Type On Call 4

Aldus
- Freehand 3.0 Ca
- Pagemaker 4.0 489
- Persuasion 2.0 319

Altsys
- Art Importer 2.0 8
- Fontographer 3.2 249
- Metamorphosis 1 8

Baseline Publishing
- Color MacCheese 5

Broderbund
- Banner Mania 3
- TypeStyler 1.5 11

Claris
- Claris CAD 598
- MacDraw II 287
- MacPaint 2.0 8

- Ancient Art Of War At Sea 28.
- Playmaker Football 30.
- SimEarth 39.
- SimCity 29.
- SimCity Supreme 47.
- The Playroom 29.
- Carmen San Diego (Europe)? 29.
- Carmen San Diego (U.S.A)? 29.
- Carmen San Diego (World)? 29.
- Carmen San Diego (Time)? 29.

Casady & Greene
- Crystal Quest 2.2 27.
- Mission Starlight 29.
- Sky Shadow 29.

Centron
- Casino Master B & W 35.
- Casino Master Deluxe Color 39.

Delta Tao Software
- Spaceward Ho! 35.
- Strategic Conquest 3.0 35.

Electronic Arts
- Bard's Tale 32.
- Chessmaster 2100 31.
- Chuck Yeager's (A.F.T.) 31.
- Weaver Baseball 34.
- Might & Magic II 38.
- Starflight 39.

Entertainment On-Line
- Lottery Tracker & Wheeler 22.

Inline Design
- Bomber (w/Headphones) 32.
- Darwin s Dilemma 31.
- Tesserae 32.

Lucasfilm
- Indiana Jones/Last Crusade 33.
- Hype Dream 17.

Mediagenic
- Shanghai 19.

Micro League Sports
- Micro League Baseball II 35.

Microprose
- Pirates! 35.

Mindscape
- Balance Of Power 1990 32.
- Colony 31.
- Crossword Magic 33.
- Deja Vu 29.
- Oeja Vu II (Las Vegas) 29.
- ShadowGate 24.
- Uninvited 24.

Silicon Beach Software
- Apache Strike 1.1 31.
- Beyond Dark Castle 31.
- Dark Castle 31.

Software Heaven
- OIDS 32.

Software Toolworks
- Cribbage King/Gin King 26.
- Hunt For Red October 21.
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- V-I 17 & 18 All The People 39
- 3 & 4 For Pub...g 39.
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- Fontina 35.

Electronic Arts
- Studio/32 448.
- Studio/8 V2.0 189.

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MacroMind
- MacroMind Director 439.

MediaLab Tech
- PictureLink 224

Paracomp
- FilmMaker 438.
- Model Shop 375.
- Swivel 3D Professional 435.
- SwivelArt 81.

Silicon Beach Software
- Personal Press 195.
- Super 3D 2.0 (Color) 328.
- SuperPaint 2.0 131.

Solutions Inc.
- Curator 89.

Symmetry
- Mariah 82.

Tactic Software
- Icon-It! 44

TimeWorks
- Publish It! Easy 2.0 139.

Zedcor Inc
- Deskpaint/Deskdraw 3 114.

HARDWARE

Abaton
- Interfax 24/96 Fax/Modem 345.
- Scanner 300/Color 1484.
- PhotoShop for 300/Color 394
- Scanner 300/GS 8 Bit 998.

Applied Engineering
- Mac Drive (FDHD compat) 219

DataLink
- Express 172.
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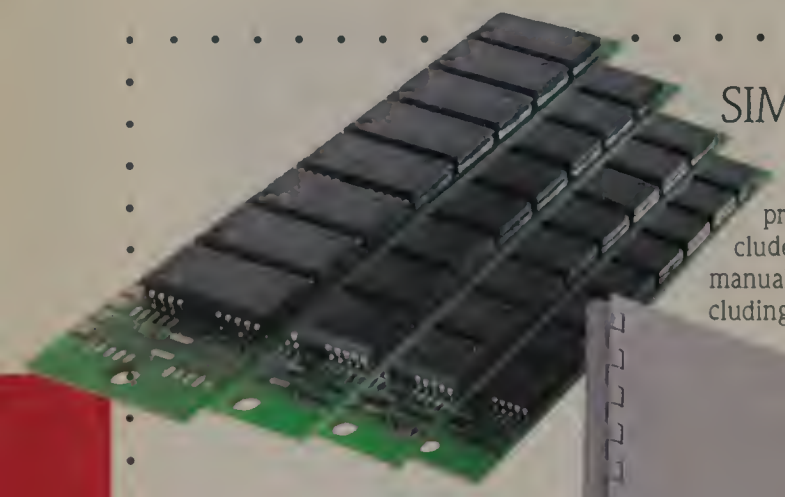
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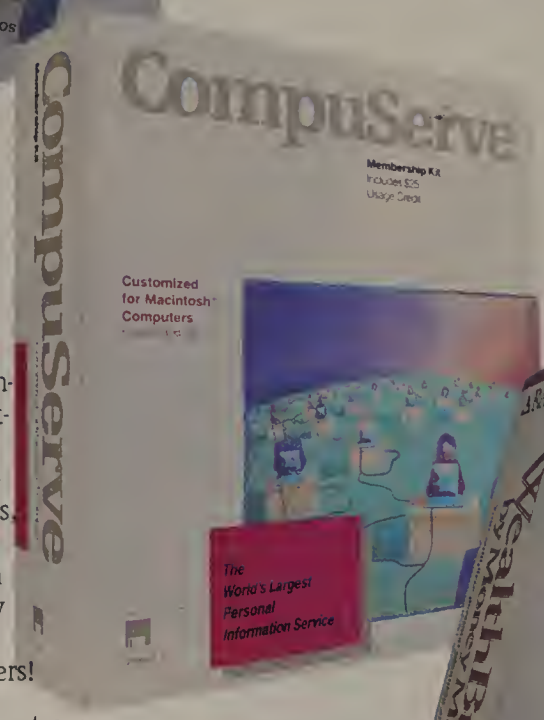
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Ars Nova
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Deluxe Music Con Set 2.5 82
Farallon
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MacRecorder 2.0 ..... 159.
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SoundEdit ..... 128.
Opcode Systems
Book Of MIDI ..... 29.
EZVision ..... 98.
Galaxy Universal Librarian 189
MIDI Play ..... 45.
Pro + MIDI Interface ..... 58.
Studio 3 Midi/Smpte Interface . 268.
Vision ..... 368.
Passport Designs
MIDI Interface 74
Note Writer II ..... 289.
Sound Apprentice ..... 165.
Trax ..... 58.
Praxitel Inc.
Read My Lips ..... 65.

PROGRAMMING

Addison Wesley
Guide to Mac Family Hard ..... 21.
Mac C Prog Primer Vol 1 ..... 19.
Mac C Prog Primer Vol 2 19
Mac Pascal Prog Primer Vol 1 19
Macintosh Program Secrets 18
Programmers Online Companion 32
Inside Macintosh Series
Vol 1 18
Vol 2 19
Vol 3 17
Vol 4 19
Vol 5 19
X-Ref 9
Macintosh Inside Out Series
Elements of C++ Macintosh Programming ..... 19.
C++ Programming with MacApp 19
Complete Book of HyperTalk 2 19
Mac Prog Guide to MPW Vol 1 19
ResEdit Ref (w/ResEdit 2.1) . 23.
Bowers Development Corp.
AppMaker 1.1 214
Digitalk
Smalltalk/Vmac V1.1 124
Microsoft
QuickBASIC 1.0 64
Microsoft Press
Inside SuperCard 1.5 ..... 18.
Silicon Beach Software
Super Card 1.5 ..... 195.
Somak
Script Edit 2.0 ..... 59.
Symantec
Just Enough Pascal ..... 52.
Think C 4.0 164
Lightspeed Pascal 3.0 ..... 159.
TGS Systems
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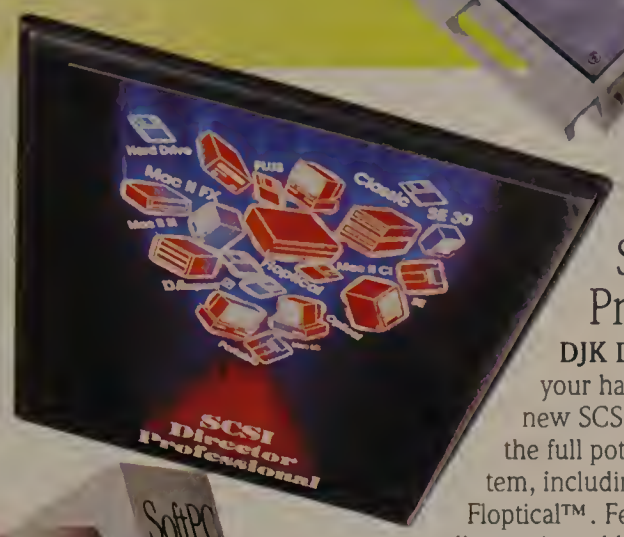
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Alsoft
Diskexpress II 52
ASD Software Inc.
FileGuard 2.5 . . . . 134.
FileGuard 2.5 (10-User) . . . . 575.
FileGuard 2.5 (5-User) 347
Baseline Publishing
INIT Manager . . . . 34.
Thunder 7 . . . . 58.
Berkeley System
After Dark 2.0 21
CE Software
Alarming Events 84
Calendarmaker 3.0 32
Disktop 4.0 + Gofer & Util . . . . 63.
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Microseeds
Init Picker 2.0 35
Redux . . . . 48.
Now Software
Now Utilities V 2.0 69
ON Technology
On Location . . . . 72.
Paragon Concepts
MacQWERTY 29
Psybron Systems
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Sabastian Software
Image Grabber 2.0 33
Salient
Disk Doubler 45
Software Innovations
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Disk Fit 2.0 58
Symantec
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Getting Started with Resource Editing

CUSTOMIZE THE MAC AND YOUR FAVORITE PROGRAMS

BY JIM HEID

Are you the customizing type? Are posters puttied to your office walls? Do you replace the buttons on new clothes? Make substitutions at restaurants? Is there a Garfield doll stuck to your car's rear window, above the MEB4U license plate?

If you answered yes to any of the above, this column's for you. You may already have discovered some of the Mac's built-in customizing features, such as the ability to change the desktop pattern and beep sound using the Control Panel. You may have even discovered how to create your own start-up screen to replace the ubiquitous "Welcome to Macintosh" message. And if you have a color Mac, you may have used the Colors Control Panel to change the color used to indicate selected text.

But the Mac's malleability doesn't stop there—not by a long shot. To satiate your desire to tailor and tweak, you'll want a library of *resource-editing* utilities. These programs let you customize the way the Mac looks and operates by altering *resources*, which are small, structured tidbits of information the Mac uses as it runs.

You can perform two basic kinds of customizing tasks with a resource editor. The first involves making cosmetic changes—adding new beep sounds and altering the appearance of windows, scroll bars, dialog box buttons, the mouse pointer, the Trash Can, and other icons. The second category involves functional enhancements—changes that actually alter the way the Mac or a certain program runs. You can add or change ⌘-*key* shortcuts to menu items, rephrase a confusing dialog box message, add a custom page size to the ImageWriter's Page Setup dialog box, and tailor the way the Finder displays the contents of disks and folders.



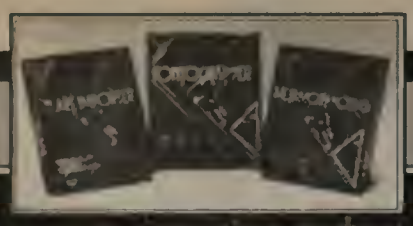
MARK JASIN

This month, I present some background on resources and their roles, and I also spotlight some popular resource-editing utilities and pass along several customizing ideas.

Resource Basics

Resources allow software developers to create and store a program's user interface elements—its menus, dialog boxes, buttons, tool palettes, and so on—separately from the program's code itself. This separation makes it easy for software developers to adapt, or *localize*, their programs for different countries. To create a version of a program for use in, say, France, a developer simply alters the program's resources, translating the English menus and dialog box text into French. Besides translating text into other languages, localizing also involves displaying date and currency values in the appropri-

(continues)



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ate format. Without resources, a developer has to substantially change a program's code to adapt it for another country. With resources, a nonprogrammer can do the job in an afternoon.

Resources are grouped by function into *resource types*, which have four-character names such as MENU and LAYO. Each resource is assigned an identification number within its resource type. This scheme makes it possible for resources of different types to have the same ID number—while those within the same group must have unique ID numbers.

When a program needs a given resource (for example, a "Save changes before closing?" dialog box), the program requests the resource by ID number from the *Resource Manager*, a portion of the Mac's system software whose job is finding and loading the requested resources.

Many resources (fonts, for example) can be shared by more than one program, adding consistency to the Mac's operation and saving disk space and memory by putting the things all programs can use in a single place (often the System file). (Incidentally, if you find a resource named WDEF, don't assume the Mac is infected with the virus of the same name. WDEF is a standard definition procedure for creating windows and a general resource located in the System file.)

Resources also help the Mac manage its memory more efficiently. A software developer can designate certain resources as *purgeable*—cleared from memory when it's needed for other uses. When the Mac accesses a disk after you choose a rarely used command, it may be loading a resource that wasn't in memory. And chances are if you choose the same command again a

(continues)

CUSTOMIZING CANDIDATES

Resource Type	Description
ALRT	Alert. Template for an alert box's appearance.
BNDL	Bundle. Used to associate files with their icons.
ICDN	Icon. A single icon definition, like those in the Chooser window.
ICN#	Icon list. A series of icon definitions; generally used by the Finder to show icons in various states (active, inactive, hollow); application icons are ICN# resources.
cicn	Color icon. Color version of ICN#.
icl [1]	Large icon. System 7.0 version of cicn. Made up of icl8 (8-bit) and icl4 (4-bit).
ics [1]	Small icon. System 7.0 version of cicn. Used with MultiFinder. Made up of ics8 and ics4.
CURS	Cursor. Defines appearance of a pointer.
crsr	Color cursor. Color version of CURS.
CNTL	Control template. Defines appearance or name of a control such as a button.
DITL	Dialog item list. Defines what appears in a dialog box or alert box.
DLDG	Dialog box. Template for a dialog box's appearance.
DRVR	Driver. Program code for DA or driver.
FKEY	Function key. A ⌘-shift-*number* routine.
FONT	Font. Font bitmap description.
INTL	International resource. Contains display data applicable to a particular country.
MENU	Menu. Defines an individual menu's commands and keyboard shortcuts.
PAT1	Pattern. Defines a QuickDraw pattern (the patterns shown in draw and paint program palettes).
ppat	Pixel pattern. Used to generate desktop patterns.
PAT#	Pattern list. A collection of patterns.
PICT	Picture. These are pictures that often appear when you choose an About command (also appear in Alarm Clock and Control Panel DAs).
PREC	Print record. Storage area for printer driver data.
snd [1]	Sound resource. Allows playing of synthesized and digitally recorded sounds.
STR [1]	String. A series of characters that may appear in a dialog box or be used by a program.
STR#	String list. A collection of strings.
SIZE	Size. Memory-requirements data used by MultiFinder and System 7.0 to create a window.

[1]Name includes a space at the end. Most programming manuals list these resources within single quotes, for example, 'snd ' and 'STR '.



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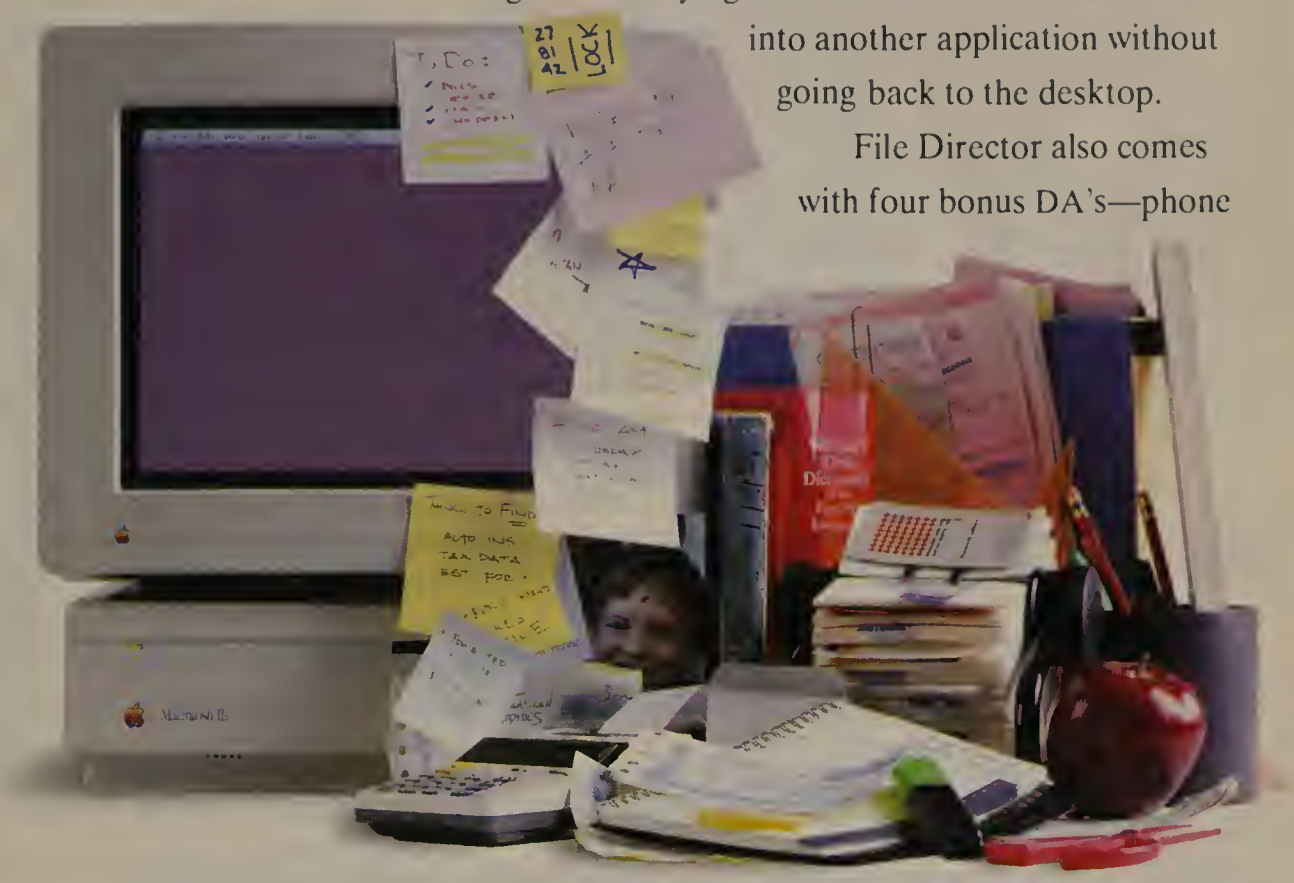
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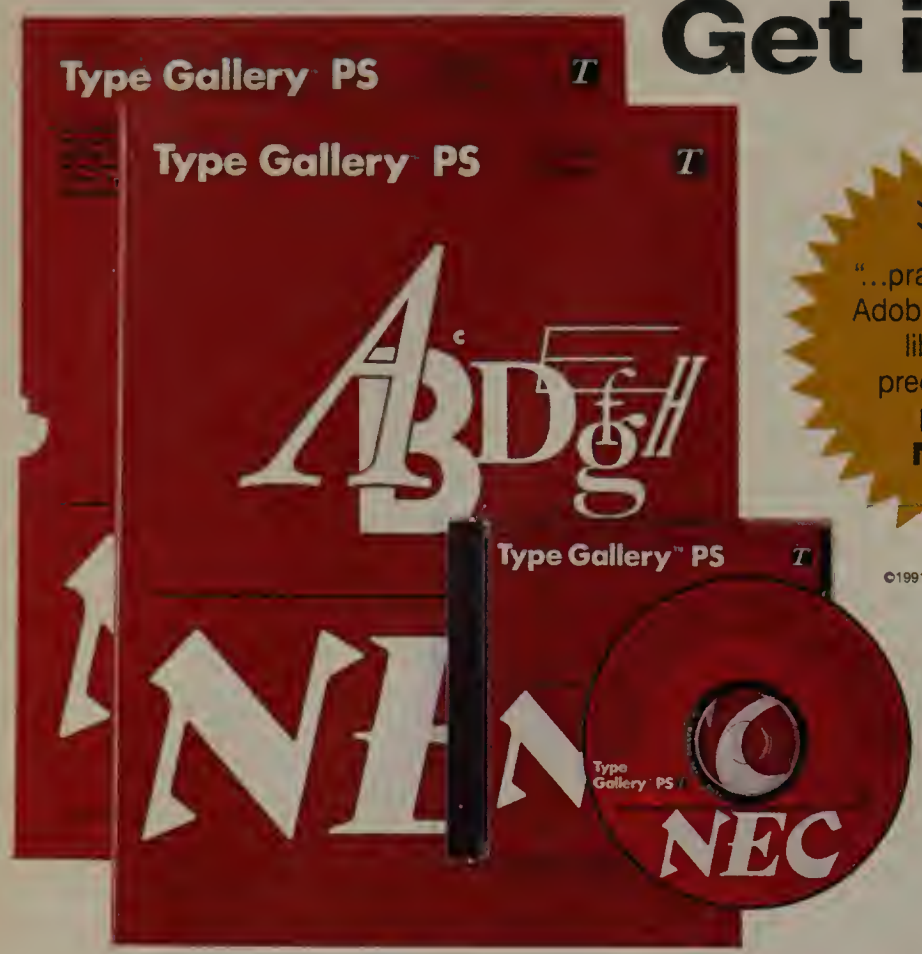


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moment later, the Mac will not access the disk, since the resource is still present in memory. "Customizing Candidates" describes some resources that are ideal for tinkering with.



Resource-Editing Software

Resources let you customize a program without having to be a programmer. If you can double-click on icons and chose menu commands, you can use the latest resource editors.

But caution: These are power tools. You can irreparably damage the file you're modifying if you make a mistake. To avoid disaster, always follow the Prime Directive of Resource Editing: *Never modify the original version of a program, System file, or document.* And save your work often; most resource editors have a Revert command that lets you fall back on the previously saved version of a file.

For cosmetic customizing, try Dubl-Click Software's ClickChange, Preferred Publishers' Personality, or Palomar Software's Colorizer. ClickChange and Personality allow you to change the appearance of windows, scroll bars, dialog boxes, buttons, pointers, and more (see "Mac Makeover"). You can also colorize virtually every element of the Mac's interface—Colorizer's specialty.

Both ClickChange and Personality also work with digitized sounds, another type of resource. Both utilities let you choose from a variety of new system beeps and assign sounds to different events, such as when you insert or eject a disk, drag or resize a window, or even press a key.

But the king of sound customizers is Bruce Tomlin's shareware SoundMaster, which supports the aforementioned aural options as well as several more—including the ability to play a sound when you choose the Finder's Empty Trash command. To move beep sounds into and out of the System file (and other files, such as HyperCard stacks), try Riccardo Ettore's shareware SoundMover.

A good source for utilities, sounds, color icons, cursors, and desktop patterns is any online information service or user group library.

As for functional modifications, one of the most useful you can make is customizing the Finder's LAYO (short for *layout*) resource, which controls several Finder characteristics—the amount of space put between icons, whether you're warned that you've thrown away a program, the font and format in which dates and other information are displayed, and more. A free utility called Layout (by Michael C. O'Connor) makes it easy to modify the LAYO resource to both tailor the Finder to your tastes (see "Redecorate the Desktop") and make it work better for you. Symantec's The Norton Utilities for the Macintosh includes Layout Plus, a version of Layout with more customizing features.

(continues)



MAC MAKEOVER This Mac (top) is wearing a new window and scroll bar style, thanks to Dubl-Click Software's ClickChange (bottom). ResEdit was used to create the custom Trash icon, the appropriately renamed Empty Trash command, and the ⌘-*key* shortcuts for the Flush, Restart, and Shut Down commands. The ClickChange screen shows several animated cursor replacements for the wristwatch's moving hands.



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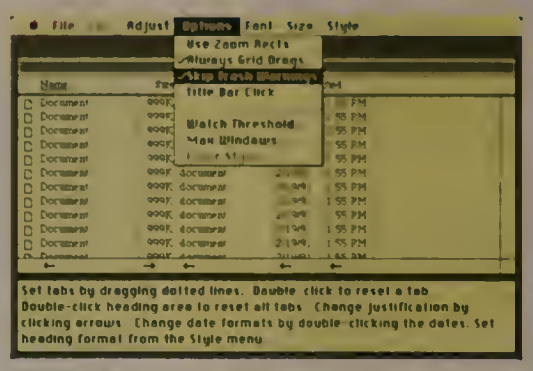
A common request of ImageWriter owners is for the ability to add custom page sizes to the ImageWriter Page Setup dialog box—perhaps for printing on index cards or special label stock. It's a breeze, thanks to a free utility called PREC Manager by Bill Steinberg. CE Software's Widgets utility, part of the MockPackage Plus Utilities, provides the same feature.

The World of ResEdit

To Mac aficionados, customizing resources means using Apple's ResEdit utility, which has been around nearly as long as the Mac itself. The latest version (2.1) sports an elegant design that makes many resource-editing jobs as easy as clicking and dragging (although you can still wreak havoc by editing resources indiscriminately).

ResEdit is available through most user groups and online information services such as America Online. You can also buy it from the Apple Programmer's and Developer's Association, or APDA (800/282-2732 in the U.S., 800/637-0029 in Canada). But the best way to get ResEdit is to buy *ResEdit Complete* (Addison-Wesley, 1991). Written by Peter Alley (one of ResEdit's designers) and Carolyn Strange, it's the best guide to understanding and tinkering with ResEdit and resources I've seen. It also includes a disk containing ResEdit 2.1 and a variety of fun resources you can add to your system, including animated mouse pointers and replacement icons for alert boxes and the Trash Can. (The, uh, Water Closet icon pairs up well with a SoundMaster-modified Empty Trash command, if you get my drift.)

There's also Apple's *ResEdit Reference* (Addison-Wesley, 1990), a somewhat dry overview of ResEdit's capabilities. A better book for the customizer is *Zen and the Art of Resource Editing* (BMUG, 1990; 415/549-2684). This little volume contains concise overviews of various resource-editing concepts and projects and includes two disks containing ResEdit and a variety of replacements for mouse pointer, icon, and keyboard resources. And if you graduate beyond ResEdit (not likely, unless you are a programmer), you will want Mathemaesthetics' Resorcerer, a resource editor so powerful it makes ResEdit look lame.



REDECORATE THE DESKTOP Layout, a utility by Michael C. O'Connor, lets you customize numerous aspects of the Finder without having to use ResEdit to alter the Finder's LAYO resource. Here, the format of the Finder's text views has been changed—the text is in Times instead of Geneva, several columns have been narrowed, and the date format has been changed.

ResEdit Project Sampler

I've summarized the basics of ResEdit in "A ResEdit Primer." ResEdit lets you perform all of the customizing jobs that ClickChange, Layout, and PREC Manager can perform, although those programs are easier to use and, more to the point, are less prone to accidental misuse. But there are customizing tasks that demand ResEdit's power. Among them:

- *Adding or changing ⌘-key shortcuts* A keyboard-enhancement utility such as CE Software's QuicKeys² enables you to change a program's keyboard shortcuts, but the shortcuts don't appear in the program's menus and they won't be copied if you move the program to a different disk. When you alter a program's MENU resources with ResEdit, your custom shortcuts are there for good—or until you change them again (see "Modifying Menus").
- *Rearranging a dialog or alert box* If you're fond of long document names, you might wish that a certain program's Open dialog box showed more of them. By editing a program's DITL resources, you can enlarge the list box to show longer names. Or, you might want to add descriptive text to a dialog box to remind you of its purpose. If a certain program annoys you by beeping twice when asking if you want to "Save changes before closing?" edit the appropriate ALRT resource and use ResEdit's Set ALRT

(continues)



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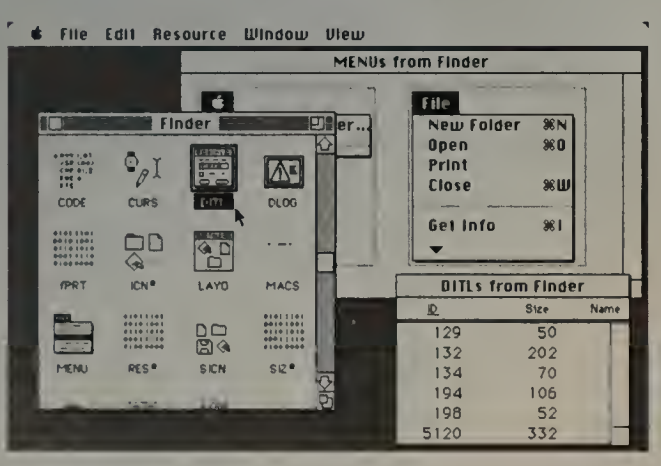
Stage Info command to banish the beeps. Using the same command, you can even change an alert box's default button (the one you can choose by pressing return). When editing a dialog box, be sure not to remove any items or change them into other items (for example, don't change a check box into a radio button). Also avoid deleting codes that begin with a caret (^) and end with a number, as in ^0 or ^1. These codes represent placeholders that the Mac replaces with other text. For example, in a dialog message that reads "Save changes to ^0?" the Mac replaces ^0 with a document name.

• *Modifying the keyboard layout* By editing the System file's KCHR resource, you can rearrange the keyboard layout to suit your tastes. One useful tweak involves changing the shift-period key sequence to generate a period (not the less-than symbol) and shift-comma to generate a comma (not the greater-than symbol). With this modification, you can type text such as *P.O.* and *D.C.* without having to release the shift key for each period. Other possibilities include moving the typographer's quotes or other often-used option-*key* characters to less finger-twisting key positions.

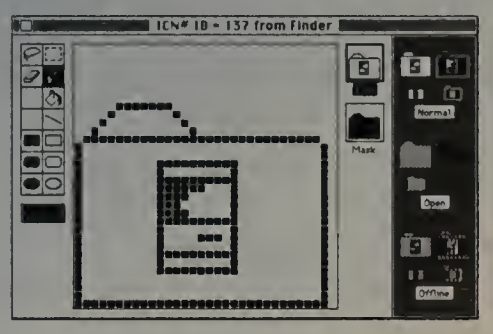
• *Modifying date, time, and number formats* To determine how to display date, time, and numeric values,

A RESEDIT PRIMER: LEARNING THE BASICS OF RESOURCE EDITING

When you open a file with ResEdit, its resources appear in a *type picker* window. To access the resources of a given type, double-click on that type's icon. Doing so displays a *resource picker* window that shows the resources of that type in the file you've opened. Resource pickers for the Finder's MENU resources and for its dialog box resources are visible here. As these examples show, some pickers display their contents graphically; others use text. Double-clicking on a resource in a resource picker window opens that resource for editing.

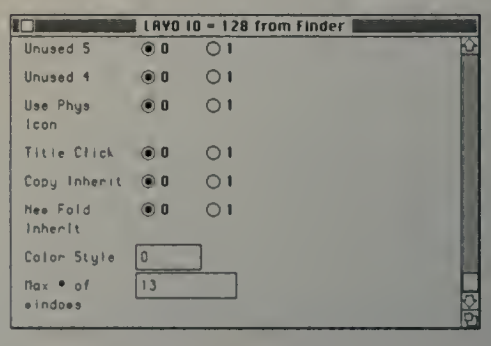


Some of ResEdit's *graphical editors* provide FatBits displays for editing icons or fonts. The editor for the Finder's ICN# resources is shown here. Notice that an ICN# resource comprises the same basic icon in several styles—the Finder uses the variants to indicate that an item is selected or not selected; selected and open or not selected and open; and selected but off-line (its disk is ejected



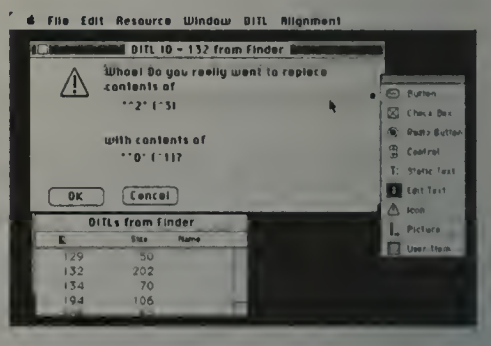
but still on the desktop) or not selected but off-line. You can customize the icons the Finder uses by editing ICN# resources, but for the Finder to recognize the new icons, you need to rebuild the disk's Desktop file (restart the Mac while pressing 1 and option until you are asked if you want to rebuild the Desktop file, then click on OK). The painting tools, which are also used by ResEdit's font, mouse pointer, and pattern editors, operate like those of HyperCard and most painting programs.

The editor for the Finder's LAYO resource isn't as flashy as ResEdit's graphical editors, but it's powerful

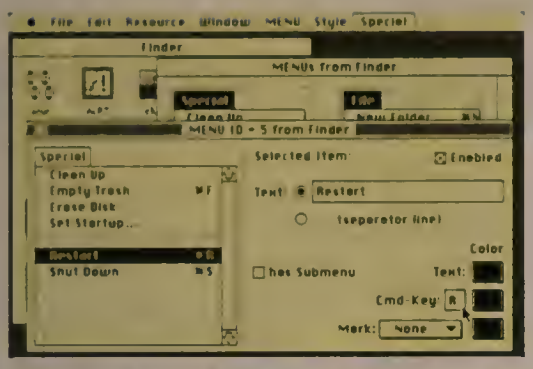


nonetheless. The Use Phys Icon option is a useful one to activate on Macs with two floppy drives (to activate an option, click on the 1 button next to the option). Instead of displaying a disk icon when you insert a floppy disk, the Finder displays an icon of the Mac, with an arrow pointing to the drive containing the floppy. When the Title Click option is active, you can open a folder's parent folder (the folder containing the folder) by double-clicking on a window's title bar. These and the many other LAYO options not visible here are often easier to change using Michael C. O'Connor's Layout utility.

ResEdit's dialog box editor lets you reposition items by clicking and dragging and add items by using the



palette at right. (It's safe to add static text, icons, and pictures to a dialog box, but avoid adding any other items or deleting any existing items.) This slightly rephrased Finder dialog box also shows several placeholders (^0, ^1, ^2, ^3), which the Mac replaces with text—in this case, disk names. The bottom of this screen shows ResEdit's DITL picker.



MODIFYING MENUS **ResEdit's MENU resource editor lets you add ⌘-*key* shortcuts to menus. Here, shortcuts are being added to the Empty Trash, Restart, and Shut Down commands.**

the Mac uses two System file resources: itl0 (for date values) and itl1 (for time and currency values). By altering the itl0 resource, you can change the date format that the Finder uses in its list views (see "Short Dates"). By altering the itl1 resource, you can change the format used for currency and numeric values—handy if you're preparing documents for colleagues in other countries.

Customizing Caveats

ResEdit gives you full access to the resources that the Mac and its programs use, but that doesn't mean you can perform the same modifications on every program. Many programs use resources in nonstandard ways. Microsoft Word, for example, doesn't use MENU resources (Word provides its own menu-customizing features). Similarly, Aldus PageMaker 4.0's resources aren't stored in the PageMaker application file, but in a System Folder file called PM4 RSRC. And MacDraw II stores MENU resources that list customized views, line, and font settings in its own documents.

That last example brings up an important point. Resources in a document override those in an application, and resources in an application override those in the System file. For example, the System file contains standard templates for the Open and Save dialog boxes, but many applications override them and provide their own. Therefore, modifying the System file's Open and Save dialog boxes may not affect your favorite program.

When you're modifying a Finder or System file, you need a way to replace the original Finder or System file on your start-up disk. You can't sim-

(continues)

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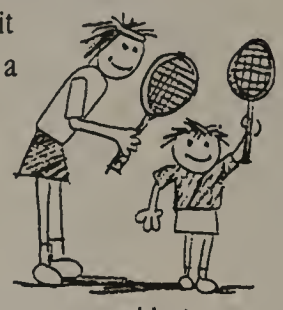
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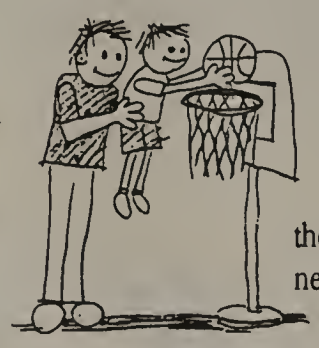
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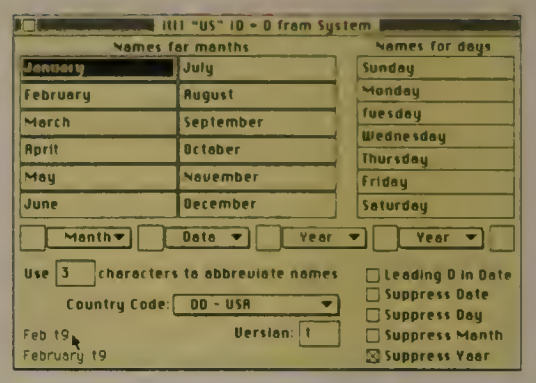


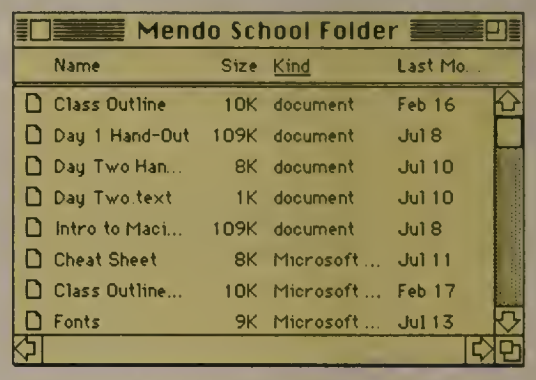


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SHORT DATES By editing the System file's itl1 resource, you can customize the names and formats that the Mac uses to display date values. Here, the pop-up menus and check boxes at the bottom of the itl1 editor (top) have been used to change the Mac's date format to display only the month and the date (bottom).

ply copy the modified version to the start-up disk's System Folder because the Mac can't replace a file that's currently in use. Try this technique: create a start-up floppy disk containing a pared-down System Folder, and start up with this disk. Then copy the modified Finder or System file to your regular System Folder. And remember, never modify the original version of a file. Make a duplicate by selecting the file and choosing Duplicate from the Finder's File menu.

Finally, don't ignore the aesthetic aspects of resource editing, especially if your Mac will be used by others. Go ahead—make your Mac's interface look like a prop from "Pee-wee's Playhouse." But don't force your tastes on an unsuspecting colleague. One person's Trash is not necessarily another person's toilet. ■

Jim Heid is a contributing editor of Macworld *who each month focuses on a different aspect of Mac fundamentals. An updated and expanded collection of his* Getting Started *columns, the* Macworld Complete Mac Handbook, *was published this spring by IDG Books Worldwide.*

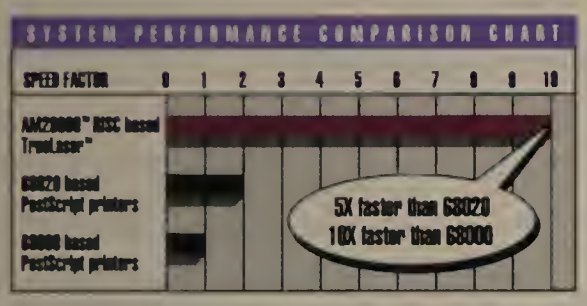
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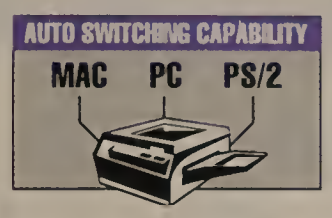
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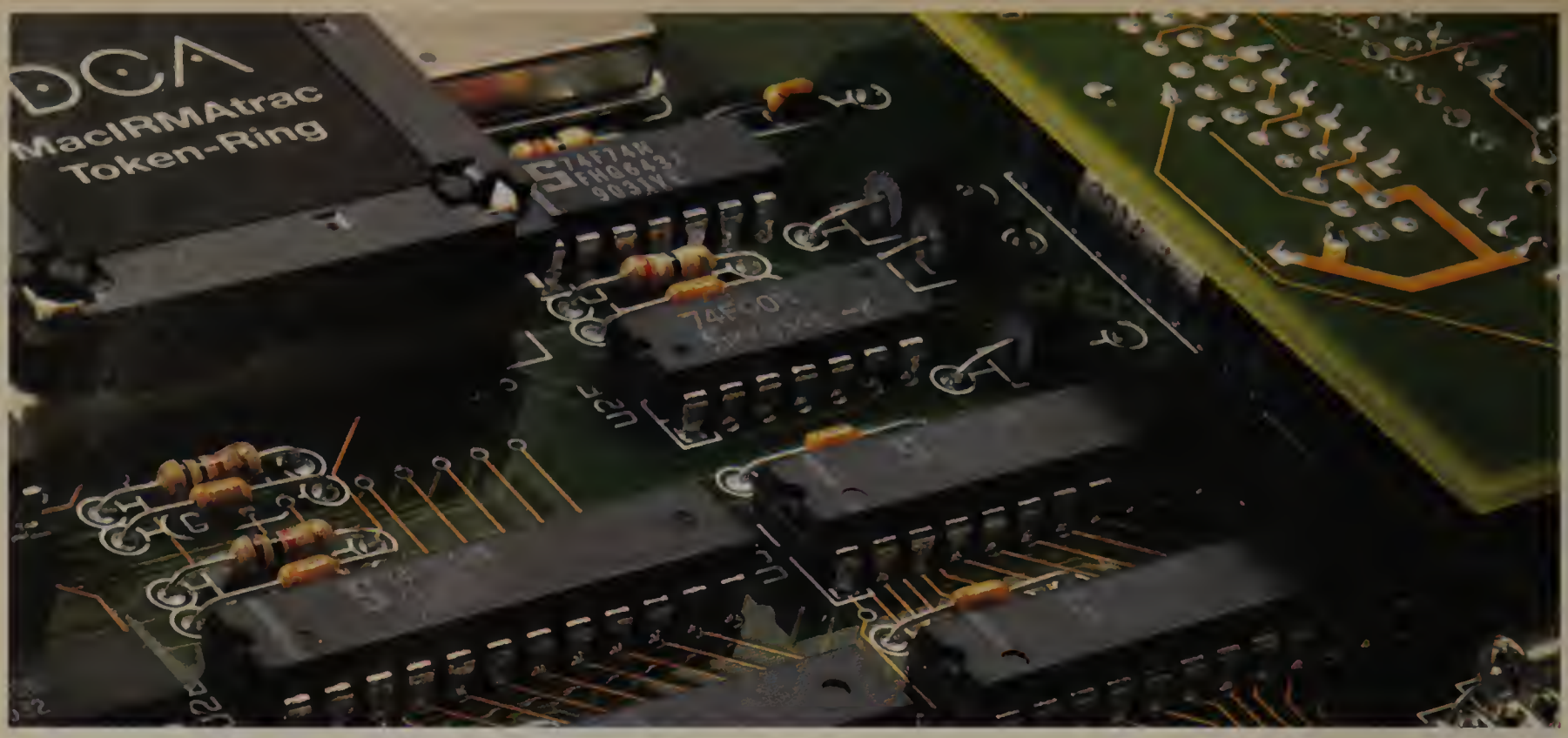
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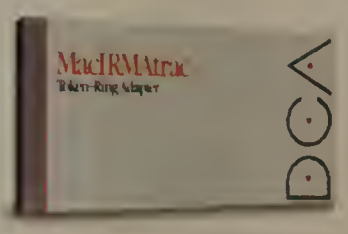
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Insights on MacProject II

TIMESAVING TIPS TO KEEP YOUR PROJECT ON TRACK

BY PEGGY J. DAY

Managing a project can require juggling so many varied tasks that it's sometimes as daunting as completing the project itself. Version 2.1 of MacProject II provides a bevy of tools to help you manage projects quickly and effectively; but as with most other project-management software packages, the learning curve can be formidable.

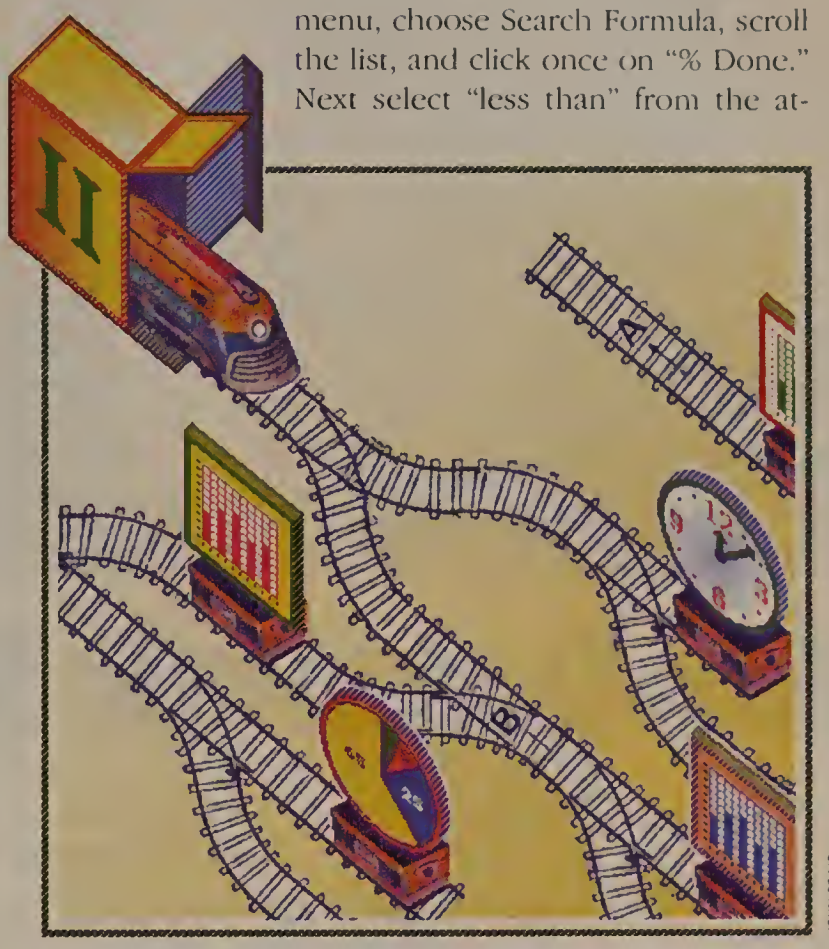
These hints and shortcuts are designed to help the novice and the experienced project manager learn to shorten planning and tracking time. Thanks to Claris tech support's Kevin Jundt and Keith Proctor and Product Manager John Perr for assistance in assembling these tips.

Making Dummy Formulas Work Smart

The Project Table chart contains 63 columns of information, which can mean a lot of scrolling and collapsing to see the columns you are looking for. You can create dummy Search Formulas that remember which columns were collapsed or expanded in the Project Table. Creating these blank search formulas is especially useful if you want to import or export only specific columns of data to a spreadsheet or database. Once you save a dummy Search Formula, it always contains all the tasks from the Project Table, but only shows the tasks that you have selected.

To create a dummy formula, use any project file that you have, and collapse the columns on the Project Table so that only the columns you are interested in are showing. From the Search menu, choose Search Formula and scroll the list, clicking once on Name. Click on "not equal to" in the attributes list, then save the formula with a new name. You have now created a dummy or blank formula that can be used any time you want to view your project data with only the attributes you've selected.

After using a search formula that looks at data selectively, such as the dummy one you've just created, remember to choose Show All from the Search menu when you are ready to return to a file that shows all of its data.



JOHN CRAIG

Selective Searches

In addition to collapsing columns, search formulas let you select only the data that you need to see or to use in a report. If, for example, you want to track only tasks that are incomplete, you could create a formula using the search criterion "% done less than 100" to exclude all completed tasks from the screen view or report.

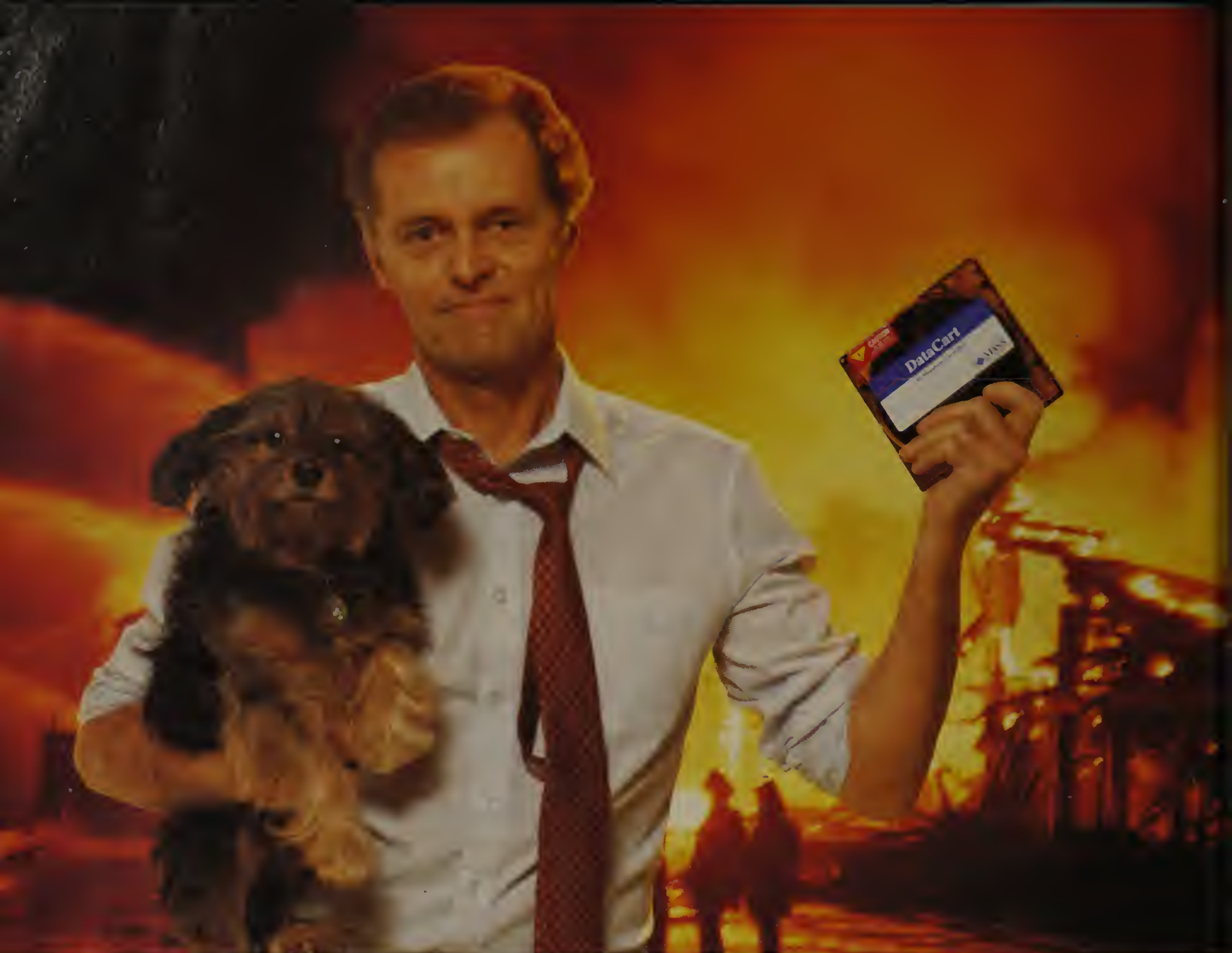
First, you need to collapse the columns on the Project Table of an existing project file, so that Task Name and % Done are the only columns showing. From the Search menu, choose Search Formula, scroll the list, and click once on "% Done." Next select "less than" from the attributes list on the left-hand side of the screen and complete the formula by entering 100 in the space at the far right side of the formula box. Clicking on the Search button causes the Project Table to show only the tasks that are not complete. Search formulas can be saved and reused to produce regular reports quickly.

Save It Again, Sam

The following steps let you save a new search formula for your next staff meeting, or if you like, for posterity.

Select Search Formula with the formula you just created still open in

(continues)



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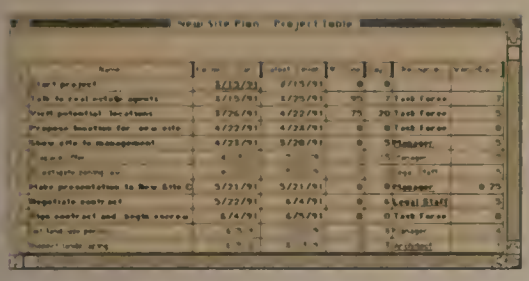
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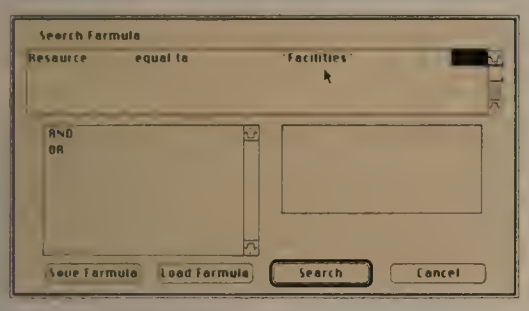
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WORKING SMART WITH DUMMY FORMULAS First arrange the Project Table so only the columns you need show. Then create a dummy formula to remember the column arrangement. This search formula should contain a string of text that would never be used as a task name. Special characters such as • (option-8) can also be used, as they are rarely used in a task name.

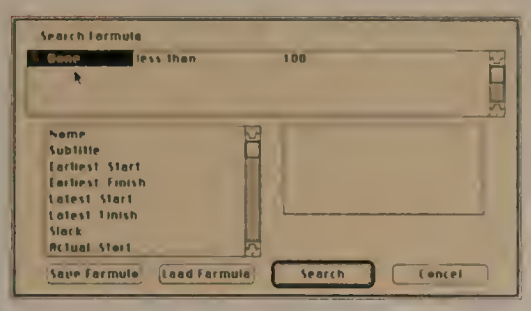


CREATE A THINGS-TO-DO LIST Use the Resource name in the Search Formula dialog box to select a separate list for just one resource. This can be tedious if you regularly print separate reports for many resources. Instead of running a Search Formula for each and printing each report, use a macro program to automate the process by executing each search formula, printing, and repeating this routine for each resource.

the dialog box. Click on the Save Formula button; enter the name SRCH/%Done<100 or something else appropriate; and click on the Save button. To use this formula again, click on the Load Formula button in the Search dialog box. The formula remembers that Task Name and % Done were the only columns showing when you saved the formula. Filtering with a search formula before exporting data via the Project Table is a useful technique, because the table will reveal only the columns to be exported, making the process faster—especially if there are several files to be exported. Graphic reports like the Task Timeline and Resource Timeline can also be customized using Search Formulas.

Making the Most of Subtitles

When entering details about a task in MacProject II, most people use Subtitle (a large text field) to add comments or descriptions. The Subtitle field can also be used to organize



SELECTING ONLY INCOMPLETE TASKS Use the Search Formula under the Search menu to segregate the data you need to see. You can expand the formula to get even more specific, for example, by adding to this formula to select only tasks with Design Phase in the subtitle field. Be wary of using many *and*'s between statements. This may restrict the search. Try using *or* instead to see if you get the results you want.

project tasks in groups to make analysis and reporting easier.

For each task, enter a code in the Subtitle field. For example, you could enter the phase in which that task occurs, such as design or construction. You can then generate a separate report for the tasks that belong to a specific phase of the project by searching for specific criteria, such as "Subtitle equal to Construction."

Using Subprojects

Some project tasks are so complex that they make up a project all by themselves. In MacProject II, subproject linking lets users create a master project to monitor complicated tasks in separate files. Using subprojects can also be a powerful means for tracking unrelated projects. For example, you can store files for various projects on the server, then create a master project with a task box representing each project you wish to track. When you create a schedule chart for the master project don't use dependency lines; instead link each task box to a subproject file.

To create a master file, first open a new project file. Draw a box for the first project to be linked, and type in the project name. Continue drawing unconnected boxes until you have all the projects you want to track. Then click on the first box, and from the Task menu select the Link to Subproject command. From the list that appears, choose the subproject you wish to link to, and click on Link to Subproject. Continue this procedure un-

(continues)



til each box is linked to a subproject. (As they are linked, the boxes turn into Supertask boxes, outlined in bold, with rounded corners.) When you want to check the detail of any subproject, just double-click on the Supertask box at the master file level while holding down the ⌘ key. You automatically move to the subproject file. Use the Task menu again and choose Return to Supertask to go back to the master view once more.

Subproject dates and costs are reflected in the master project and can be updated by selecting the Consolidate Project Family command from the Dates menu.

Using the Resource Scope

In a workgroup setting, people may be working on several projects simultaneously and may be overallocated. The Resource Histogram, however, shows only the work load of those involved in the current project unless the Resource Scope feature is used. This feature can show you total resource allocations from different projects in a single Resource Histogram or Resource Timeline.

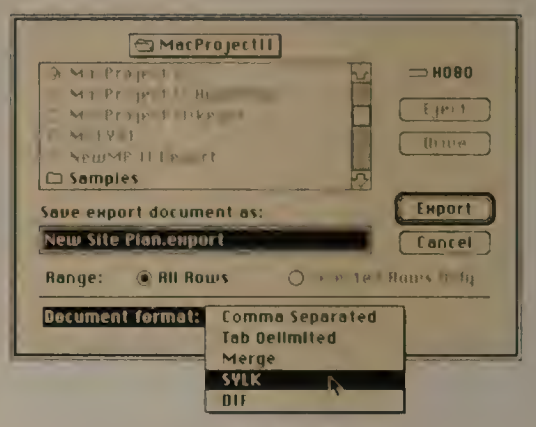
Tiling these two windows into one view is one way to view the subprojects that may be causing the overload. From the Chart menu select Resource Timeline. Then with the window-resize tool, in the lower-right corner, shrink the window to half size and put it in the lower half of the screen. Select Resource Histogram from the Chart menu. Then arrange that window so that it fills the other half of the screen. Next, line up the gray dotted lines under the dates for both reports. Scroll the window, if necessary, to see the overload bar. Select Resource List from the Resource menu, and double-click on the resource name you want, or press return until you reach the resource needed. Scroll through the Resource Timeline; you'll need to select the resource name chosen in the Resource Histogram. Compare the overload shown on the Histogram (bar over the dark line) to the bars on the Timeline to see which tasks are causing the overload.

Counting Heads

There will be times when you want the Resource Histogram and the Resource Timeline for a master project to list all the individuals working on that project. MacProject II shows resources only for the master project and doesn't automatically include resources for subprojects. You can manually add the names of people working on subprojects, but an easier way is to open up the resource table in each subproject and use the Export Data feature (File Menu) to export a text file that includes all the resources from that subproject. Do this for each of the subproject files. Then open the resource table for the master project and use the Import Data feature to import the text files with resources from each of the subprojects. This brings all the resources you have used in the subprojects into the master file more easily and with fewer errors than typing them in. By the way, MacProject II won't duplicate names that exist in both master and subprojects.

Import/Export Tips

If you use the master/subproject concept, you may find yourself opening the subprojects often to export data for analysis in another program. Use a macro program to create routines that open and export the files for you automatically—saving lots of time. Use a Search Formula to open a Project Table that displays only the columns you want to export first.



EXPORTING DATA FROM MACPROJECT II Use the File menu and choose Export Data to create a separate export file from MacProject II. Choose SYLK format if you want to include column headings and do not want the cells to be locked when exporting data to Microsoft Excel.

EXPORT FORMATS

When exporting from:	Use one of these formats:
FileMaker Pro	comma delimited, tab delimited, SYLK, DIF
Excel	tab delimited, SYLK
Wingz	tab delimited
Full Impact	SYLK

Recommended Export Formatting

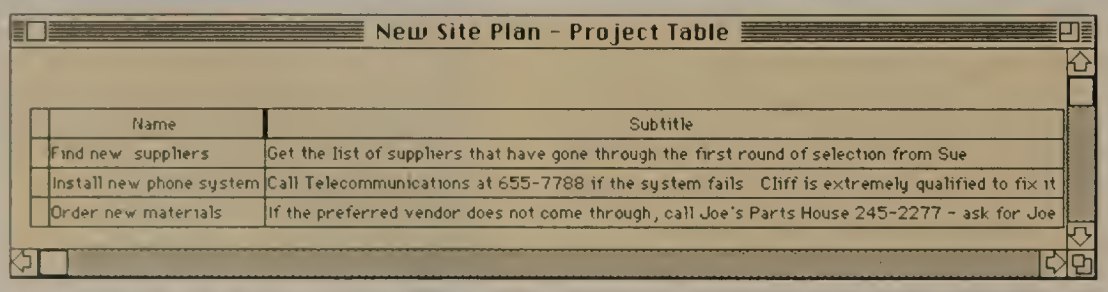
When exporting data from other applications for use with MacProject II, use the file formats shown in "Export Formats."

Note about Imports

Using the tab-delimited format creates locked cells in Microsoft Excel. Use SYLK format if you do not want locked cells. As a bonus, SYLK also brings across all the column headings from MacProject II. Locked files can cause problems if you are trying to use the Paste Link command in Excel when linking files.

Sharing the Wealth

If you've found a tip or shortcut not mentioned here, spread the word to other *Macworld* readers by sending it to *Quick Tips, Macworld*, 501 Second St., San Francisco, CA 94107.



SUBTITLES WITH SOMETHING TO SAY Subtitle fields can store project information. For example, you might put notes on your fallback plan into the Subtitle field. Use a Search Formula with a dummy formula after arranging the Project Table to show just the task name and Subtitle field. Save the formula you just created with a name like Contingency Report. Each project team member can have a copy of the plan.

Peggy J. Day is a project-management consultant with Day & Associates in Portland, Oregon, and is the author of Getting Organized Using MacProject II *(1990, Van Nostrand Reinhold)*

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Circle 342 on reader service card

L A S E R M A S T E R

UPDATES

Here's our list of some of the latest versions of Mac software that were announced at the time we went to press. The first price is the upgrade cost for registered owners; the second price is the current list price. (Send your update announcements to Updates, Macworld, *501 Second St., San Francisco, CA 94107.)*

Finale 2.6 has Undo and Redo commands for all tools, grabber hand and zoom tools to enable the user to quickly move around the score and change views, a menu-driven chord tool, and an option for automatic guitar fingerboard notation. Compatible with Apple's MIDI Manager. Coda Music Software, 612 854-1288. Contact vendor for update price; $749 new.

Interactive Physics 1.2 runs in color; lets the user print individual animation frames, sequences, and graphed data; has a feature for data export; and gives the user control over numerical formats by offering a choice between fixed- and floating-point formats, as well as the ability to select the number of digits displayed. Knowledge Revolution, 415 553-8153. $29.95; $249 new.

QuickMail 2.5 is now a stand-alone application and is based on a store-and-forward technology. Selects QuickSend and QuickConference options with hot keys, has an optional large-font display in the main screen, and has additional ⌘-key equivalents. CE Software, 515/224-1995. Contact vendor for update price; single user with server $189.95; 5-user pack $399.95; 10-user pack $499.95; 50-user pack $2299 new.

PRODUCT UPDATES

Product	V.	Req.	Rev.	Price
1st Aid Kit ★	2.8	512KE/3.0		*
4th Dimension	2.1	1MB/6.0.2		Free
Aatrix CheckWriter II ★	2.01	512K/4.1		$10
Aatrix TimeCard	2.0	512K/4.2		Free
Accountant Inc., Professional	1.0.4	1MB/6.0.3	9/90	$19.95
ACCPAC Bedford Simply Accounting	1.1	1MB/5.1		$50
AccuText	2.0	4MB/6.0.2		*
Address Book	2.0	1MB/6.0.2		$25
Adobe Illustrator	3.0	2MB/6.0.3	2/91	*
Adobe Type Manager ★	2.0	1MB/6.0.2		Free
AdWriter	2.0	1MB/6.0		Free
After Dark	2.0	512KE/4.1	5/91	*
AglaType	2.0	2MB/6.0.2		Free
Alchemy	1.1	1MB/6.0	10/90	$25
Aldus FreeHand	3.0	1MB/6.0.3		*
Aldus PegeMaker	4.0	1MB/4.1	9/90	$150
Aldus Persuasion	2.0	1MB/6.0		*
AmPeck Plus ★	4.2.2	512K/3.2		$29.95
Analog Connection WorkBench	3.0	1MB/5.0		$50
AntiToxin	1.3	1MB/6.0.2		$15
Aperture	1.7	2MB/6.0.3	7/90	*
AppleShare File Server	2.0	512K/3.2		*
ArchiText	2.0	1MB/6.0.2		Free
Aristotle's Politics	2.0	2MB/6.0.3		Free
The Art Importer	2.0	1MB/6.0		$20
ArtRoom	3.0	512K/3.2		$199
Ashlar Vellum	2.0	4MB/6.0.2		$95
Astrix ★	**1.01**	**1MB/6.0**		**Free**
AutoCalc	2.0	1MB/6.0		$95
AutoSave II	2.0	512KE/4.2	7/90	*
A/UX	2.0	4MB/6.0.5		*
BackFax	1.5	1MB/6.0.3	7/90	$7.50
BackMatic	2.0	1MB/4.2		*
Back to Basics Professional	2.0	512K/3.2		$75
Bitstream Typeface Library	2.0	1MB/6.0		*
Blueprint	2.0	1MB/6.0		*
Bomber	2.0	1MB/6.0		*
Bridge	6.0	512K/3.2		$17
Business FileVision ★	1.5	1MB/6.0.2		*
Business Sense ★	1.2	1MB/6.0		*
Business Session ★	3.2	512K/3.2		Free
CA-Cricket Presents	2.0.1	1MB/6.0		*
Calculator Construction Set ★	2.06	512K/3.2		$25
CanOpener	1.1	512K/3.0		Free
Canvas	2.1	1MB/6.0		*
Capture	4.0	1MB/6.0		$30
Central System Manager	2.1	1MB/5.0X		*
Chameleon	3.0	512K/3.2		Free
Chem3D	**3.0**	**1MB/6.05**		*
Chemintosh II		1MB/6.0.2		Free
ChromaScan	2.0	6MB/6.0.5		*
Claris CAD	2.0	2MB/6.0		$79
Codecheck	3.0	1MB/6.0		Free
Colorset ★	1.5	1MB/6.0		Free
CompileIt	1.5	1MB/6.0.2		$30
CompuServe Navigator	3.0	512K/3.2	12/90	*
ConcertWare	5.1	512KE/4.2		$35
Control II	1.1	2MB/6.0.4		Free
CopyFlow	2.0	2MB/6.0		Free
Correct Grammer	2.0	1MB/4.2	9/90	$29.95
Crystal Ball	2.0	512/4.2		$75
Data Desk	3.0	512K/4.0.2		$125
DataMerge	2.0	512K/3.2		Free
dBase Mac ★	1.01	1MB/4.1		Free
Deluxe Music Construction Set	2.5	512K/6.0.2		*
DesignStudio	2.0	1MB/6.0		*
DeskPaint ★	3.0	1MB/4.2		Free
Developer Stack	3.0	1MB/6.0		$15
DiagramMaker	2.0	1MB/6.0.2		$35
Digital Darkroom	3.0	1MB/6.0		*
DiskDoubler	3.0	1MB/6.0.2	12/90	Free
DiskExpress II	2.04	1MB/6.0	11/90	*
DiskFit and Network DiskFit	2.0	1MB/6.0		*
DiskTop	4.0	1MB/6.0	7/90	*
Display AdBuilder	1.1	1MB/6.0.3		*
DocuComp	1.5	512K/3.0	12/90	$19.95
Dollars and Sense	4.1	512KE/3.2		*
Double Helix	3.5	1MB/6.0		*
DragonWave	2.0	1MB/6.0.3		Free
Dreams	1.1	1MB/6.0.2		*
DynaPerspective	2.0	2MB/6.0.4		Free
DynoDex ★	1.21	1MB/6.0		Free
EarthQuest	**2.0**	**1MB/6.0**	**4/91**	*
Easy Color Paint	2.0	1MB/6.0.2	9/90	*
Empower II	4.0	1MB/4.2		Free
EndLink	1.1	512K/3.2		Free
EndNote Plus		512KE/3.2		$49
Exodus	2.0	1MB/6.0		$50
Extender GrafPak	3.0	1MB/6.0.2		$30
Falcon ★	2.2.1	1MB/3.2		$3
Family Heritage File	**2.7.3**	**512K/4.2**		*
Festback II	2.1	512KE/4.1		$30
Fast Forms	2.0	1MB/6.0	11/90	$25
FastLabel	2.0	1MB/6.0		$36
FastTrack	1.5	512KE/5.5		$20
FaxGete	1.1	1MB/6.0		Free
Ferrari Grend Prix ★	1.6	512K/3.2		$10
FetchIt	2.0	512K/6.0.1		*
FileMaker Pro	1.0	1MB/4.2	2/91	*
Filevision IV	1.1	1MB/4.2		$15
FilmMaker	2.0	5MB/6.0.3	3/91	*
Finale	2.6	1MB/6.0.2		Free
Findswell	2.01	512KE/3.2		*
Fontographer	3.2	1MB/4.2		*
FontShare	2.0	1MB/6.0		Free
FormsProgrammer ★	2.03	1MB/6.0.2		$15

(continues)

Bold = *first time the product is being listed*

★ = *minor update*

Req. = *min. RAM and system software required*

Rev. = *last time (in past year) reviewed this or an earlier version*

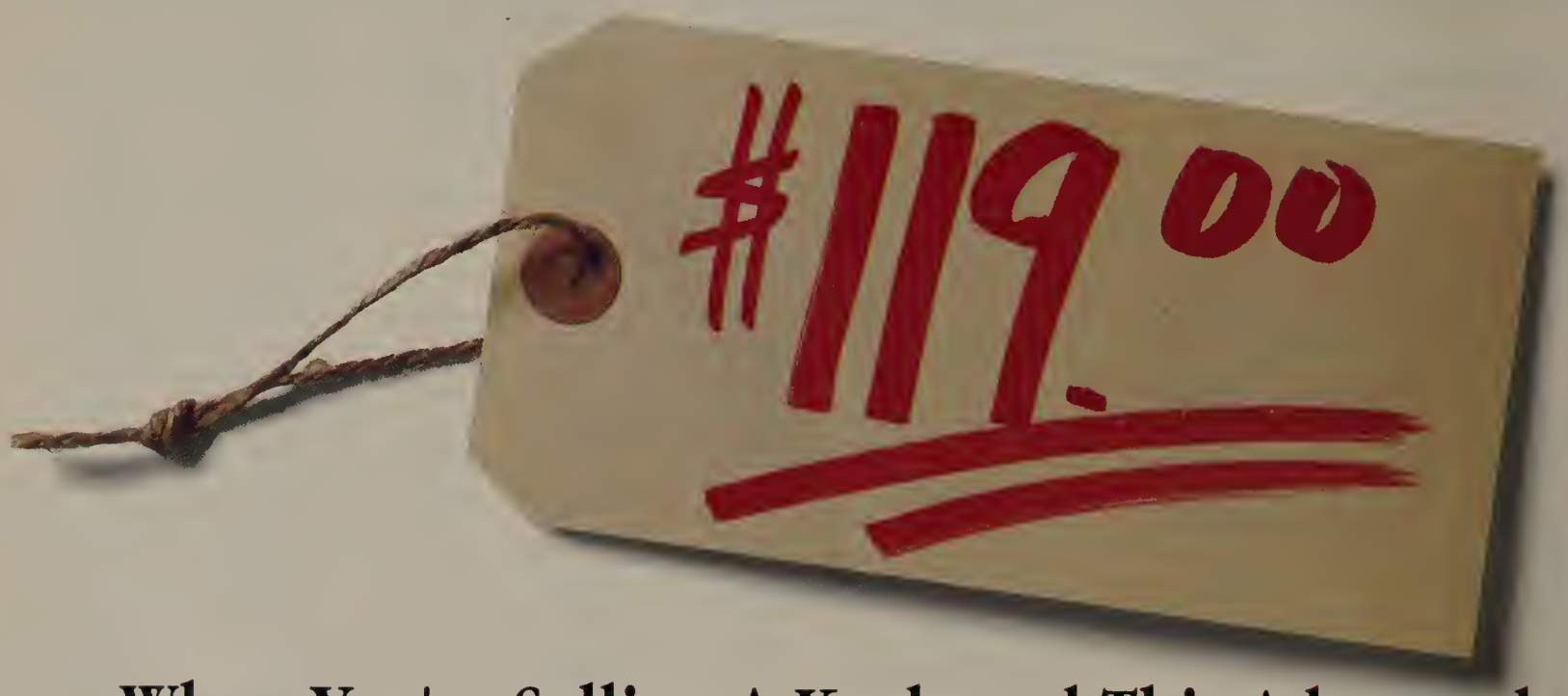
Price = *cost for update to registered owners*

* = *contact your dealer for update policy*

PRODUCT UPDATES

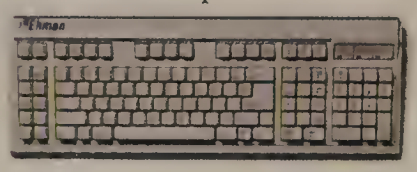
Product	V.	Req.	Rev.	Price
FountainView	3.0	1MB/6.0		$15
FoxBase+/Mac ★	2.10	1MB/6.0		$75
FrameMaker	**3.0**	**1MB/6.0**	**1/91**	*
Freedom of Press ★	2.2	1MB/6.0		Free
FreeFlow	3.0	1MB/6.0.3		Free
Full Impact ★	2.0	1MB/6.0		$50
FullWrite Professional	1.5	2MB/6.0.2		*
Gamblin' Times	3.0	1MB/6.0	3/91	$10
GeoQuery	2.0	1MB/6.0	10/90	*
Gofer	2.0	1MB/4.1		$25
GQL	2.0	1MB/5.0		*
Grammatik Mac	2.0	1MB/5.0	9/90	Free
Great Gantt	1.3	1MB/6.0	12/90	Free
Great Plains Accounting Series	5.35	1MB/6.0		*
HandOff II	1.1	1MB/6.0.2		Free
Handwriting Analyst ★	3.1	512K/3.2		$24.95
Hard Disk Util	3.0	1MB/6.0		$65
Help DA	3.0	1MB/6.0		Free
HydroMac	2.0	1MB/6.0		*
HyperAnimator ★	1.5	1MB/6.0.3		$29.95
HyperCard	2.0	1MB/6.0.3		$49
HyperDA ★	1.2	512K/3.2		$10
HyperLibrary	2.0	1MB/5.0		*
HyperTools	2.0	2MB/6.0.2		$20
HyperWindows ★	1.2	1MB/6.0.2		$20
Icon-It	2.0	1MB/6.0.2	9/90	$29
if:X Forms Designer	1.1	1MB/6.0	9/90	Free
ImageStudio	1.5	1MB/6.0		$99
ImageWriter LQ Print Driver ★	2.0	512K/3.2		Free
In-CAD	2.0	2MB/6.0		*
InfoLogic Envelope ★	1.1c	512KE/4.0		$5
Insight Expert Accounts Payable	2.2	1MB/6.0		*
Insight Expert Accounts Receivable	2.2	1MB/6.0.2		*
Insight Expert General Ledger	2.2	1MB/4.2		$99
Inspiration	3.0	1MB/4.2	11/90	*
Instant-Expert Plus	3.0	1MB/5.0		Free
Interactive Physics	**1.2**	**1MB/6.0.2**		**$29.95**
JetLink Express	2.0	1MB/6.0		$30
KidsTime ★	1.2	512K/3.2		$15
KiwiEnvelopes	3.0	512KE/4.1		$10
LanguageSystems Fortran ★	2.1	2MB/6.0.4		Free
LapLink Mac III	3.0	512K/2.0	7/90	*
LaserPaint Color II ★	1.02	1MB/6.0.3		Free
LetraStudio	1.5	2MB/6.0		$45
LetrTuck+	2.0	512K/3.2		$20
Light Checkbook Accounting	2.0	1MB/6.0.3		*
Lightspeed Color Layout System	2.0	1MB/6.0		*
Mac86	2.0	1MB/6.0.2		$10
Mac286	2.0	1MB/6.0.2		*
Mac3270	2.0	1MB/6.0.3		*
MacAnalyst	2.0	2MB/6.0		$125
MacArchitrion	4.0	2MB/6.0.3		Free
MacAtlas Paint	2.0	512K/3.2		$35
MacClassAds	4.0	1MB/6.0		*
MacConcept	3.0	1MB/6.0.3		*
MacDesigner	3.0	2MB/6.0		$125
MacDraft	2.1	1MB/6.0.2	12/90	*
MacDraw II	1.1	1MB/6.0		*
MacEnvelope	5.0	512KE/3.2		$25

(continues)



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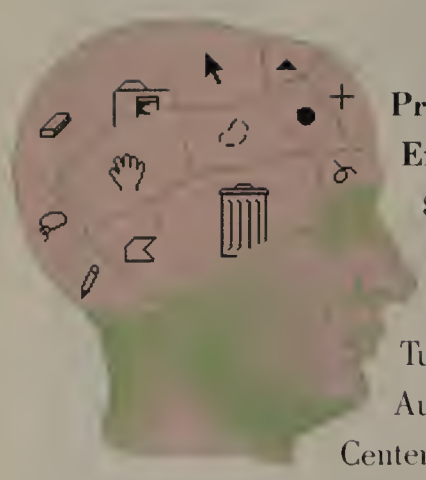
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BOSTON
AUGUST 6-9
1991

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Preregister now for MACWORLD Expo/Boston and get $10 to $15 off your ticket price.

The largest Macintosh event in the world will be in Boston Tuesday, August 6 through Friday, August 9, 1991, at the World Trade Center and Bayside Exposition Center. This year's MACWORLD Expo/Boston will fill you with information on the latest hardware, software, peripherals and services. It will thrill you with innovations that make the Macintosh easier to use. It will stir your imagination with new ways to put your Mac to work.

And that's not all. Return the attached preregistration card with your payment by July 1, and you'll receive incredible savings — $15 on all Conference Sessions* and Exhibits ($65 now, $80 cash at the door), or $10 off Exhibits-only admission ($15 now, $25 cash at the door).

When you preregister, you'll save time as well as money. We'll send your admission badge early, so you can walk right into MACWORLD Expo, right past the long lines at the door. With 50,000 people expected to attend this world-class event, preregister now and maximize your time on-line at the exhibits, not in line.

MACWORLD Expo Boston Show Hours

Exhibits and Conference Programs

Tuesday, August 6
10 a.m. to 6 p.m.

Wednesday, August 7
10 a.m. to 6 p.m.

Thursday, August 8
10 a.m. to 6 p.m.

Friday, August 9
10 a.m. to 3 p.m.

If you go to one computer show this year, make it MACWORLD Expo.

Whether your Mac is in your office, studio, home, lab or classroom, you'll find something new at MACWORLD Expo. And if you don't have a Mac yet, come and see what you've been missing.

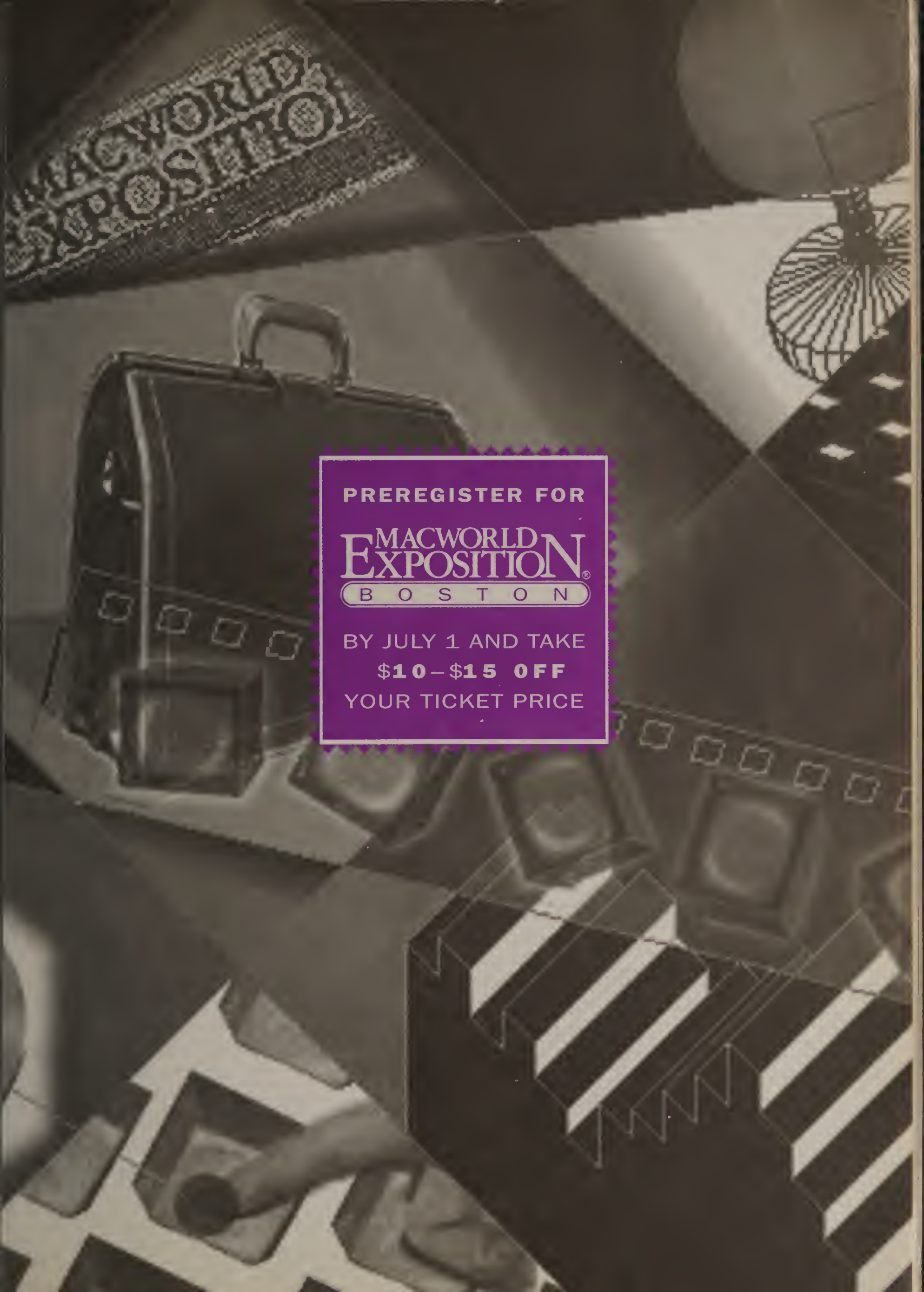
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More than 400 companies will be exhibiting in two locations, spread over 300,000 square feet. And for your convenience, there's free shuttle service connecting the World Trade Center and the Bayside Expo Center during show hours.

Ten conferences in one.

This year, MACWORLD Expo/Boston is bigger than ever with ten conferences in one. Each conference series will be all inclusive and have its own focus. Create your own agenda. Spend as much time as you'd like at any or all of them.




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Use this ticket to preregister for MACWORLD Expo/Boston by July 1 and save $10 to $15.



The largest Macintosh event in the world will be in Boston from Tuesday, August 6 through Friday, August 9 at the World Trade Center and the Bayside Expo Center. And when you preregister by July 1, you'll save time and money.

Please choose your package and fill out the form completely. Incomplete forms will be returned. One form per person: make photocopies for additional people. Please do not staple check to form. Send completed forms to:

MACWORLD Expo/Boston,
P.O. Box 4010, Dedham, MA 02026.

Registration forms received after July 1 will be returned. Purchase orders cannot be accepted. Registration fees are nonrefundable. Call the MACWORLD Expo/Boston Hotline at (617) 361-3941 for more information.

U.S. Attendees: You will be mailed your badges on or about July 24. Be sure to check box indicating where badge should be sent. All other badges will be held at the Preregistration Counter at the Bayside Expo Center for pick up beginning Monday, August 5.

International Attendees: If you're preregistering from outside the U.S. and want your badge sent to you instead of picking it up at the Bayside Expo Center, check the appropriate box below and add $45 to your preregistration fee. Fill in your exact street address (no P.O. boxes) and include your telephone number and country code. We will Federal Express your badge directly to you.

Bonus for All Attendees: All registration fees include a 6-month, $7.50 paid subscription to MACWORLD Magazine. (The basic subscription rate is $30 for 12 issues.) We'll include a subscription request form in the preregistration package we return to you in the mail.

Please register me for:

☐ **Package One $65**
Conference sessions* and exhibits. Preregister by July 1 ($80 cash only at the door).

☐ **Package Two $15**
Admission to exhibits only. Preregister by July 1 ($25 cash only at the door).

☐ (Check if applicable.) I'm an International attendee and would like my badge shipped by Federal Express. Enclosed is an additional $45.

Please send my registration badge and further information to:

Please check one: ☐ Home Address ☐ Company Address

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Street Address _____

City _____ State _____ Zip _____

Country (Other than U.S.) _____ Telephone _____

If mailing to company address:

Title _____

Company _____

☐ Check enclosed (make payable to MACWORLD EXPOSITION) Amount $ _____

☐ Master Card ☐ Visa ☐ American Express Amount $ _____

Account Number _____ Expiration Date (include all numbers) _____

Card Holder Signature (Signature necessary to be valid) _____

If card holder is other than registrant, please print cardholder's name below:

Last Name _____ First Name _____

Cash only at the door. After July 1, you must register at the show.

Please check the appropriate information:

01. ☐ Manufacturer (non-computer)
02. ☐ Manufacturer (computer industry)
03. ☐ Distributor/dealer/retailer/service
04. ☐ Business
05. ☐ Legal services
06. ☐ Communications/publishing
07. ☐ Education
08. ☐ Government
09. ☐ Consultant
10. ☐ Transportation
11. ☐ Information services
12. ☐ Utilities
13. ☐ Engineering
14. ☐ Health services
15. ☐ Other (specify) _____

Your Title

16. ☐ CEO/president/owner
17. ☐ DP/MIS manager
18. ☐ Manager/department head
19. ☐ Network manager
20. ☐ Programmer/analyst
21. ☐ Engineer/research & development
22. ☐ Consultant
23. ☐ Marketing/sales
24. ☐ Educator
25. ☐ Art director/graphics
26. ☐ Editor/writer
27. ☐ Other (specify) _____

Size of Your Organization (number of employees national and international)

28. ☐ Under 50
29. ☐ 50–99
30. ☐ 100–499
31. ☐ 500–999
32. ☐ 1,000–5,000
33. ☐ Over 5,000

Which personal computer(s) do you own/use?

34. ☐ Macintosh Classic
35. ☐ Macintosh Plus
36. ☐ Macintosh SE
37. ☐ Macintosh II
38. ☐ Macintosh
39. ☐ Macintosh LC
40. ☐ Macintosh IIsi
41. ☐ Macintosh IIci
42. ☐ Macintosh IIfx
43. ☐ Apple II Series
44. ☐ IBM PC (or clone)
45. ☐ None
46. ☐ Other (specify) _____

*MACWORLD Expo conference sessions are on a first-come, first-served basis with no guaranteed seating and are subject to change without notice. All registration fees are nonrefundable. Do not staple check to form. Send completed form, with check or money order to: MACWORLD Expo, P.O. Box 4010, Dedham, MA 02026.

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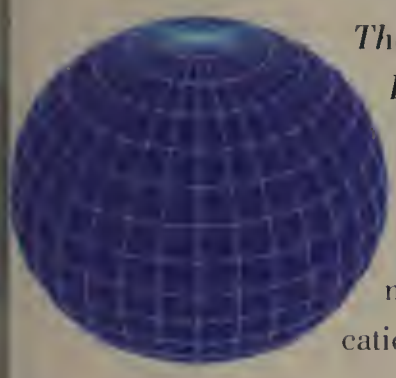


The Designer Mac. The latest trends and tips for graphic artists, ad agencies, architects and engineers.

The Macintosh in Multimedia. The dazzling developments surrounding the exciting integration of video, sound, animation, and graphics.

Mac Programmer/Developer Forum. The place for novice and veteran techies to meet, learn and brainstorm.

Future Technologies on the Mac. Cutting edge innovations destined to make the Mac even more powerful and versatile.



The Mac in Entertainment. Demonstrations, trends and how-to's for this fascinating new application area.

The Business/Professional Macintosh. Solid advice and case studies for corporate, small business, legal and health care users.

The Mac in Education. How teachers and administrators — from kindergarten through college — can use the Mac to great advantage.

Maximizing your Macintosh. Share experiences, get new ideas and insider's tricks at these advanced insider workshops.

Getting Started with Mac LC. A brand-new conference for those who are brand-new to the Mac.

You-Asked-For-It. Special requests, newest market developments and the perennial favorite, Mac User Group Extravaganza (MUSE).

UGWUMP (User Group Welcoming/Unwinding/Meeting Place). "People networking parlor" for user groups. Share success stories, exchange newsletters and literature. Learn how to start a user group in your area, and more!

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Reduced rates for hotels and cars.

What's more, you'll get a reduced rate when you book your reservation directly at one of the hotels listed here. Just mention you're coming to MACWORLD Expo. But hurry, these rooms fill up fast.

And if you plan to rent a car, you'll receive a great rate from Avis when you tell the reservations operator that you're a MACWORLD Expo attendee. Just call 1-800-331-1600 and ask for Worldwide Discount #B136000.

Don't miss out on incredible preregistration savings.

The deadline to receive your preregistration discounts of either $10 or $15 is fast approaching. So fill out the attached form today and send it in with your payment (check or credit card). And if the form is missing from this ad, or if you have any other questions, just call the prerecorded MACWORLD Expo information hotline at **617-361-3941.**

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Hotels

57 Park Plaza
482-1800; $100/$110

Back Bay Hilton
236-1100; $150/$170

Boston Marriott Copley
236-5800; $165/$185

Charles Hotel
864-1200; $168/$178

Colonnade
424-7000; $150/$170

Copley Plaza
267-5300; $175/$195

Four Seasons
338-4400; $205/$225

Guest Quarter Suites
783-0090; $145/$165

Hilton at Dedham Place
329-7900; $125/$135

Holiday Inn/Boston
277-1200; $110/$120

Holiday Inn/ Government Center
742-7630; $131/$147

Holiday Inn/Randolph
961-1000; $87/$95

Howard Johnson/South
288-3030; $75/$85

Hyatt Regency
492-1234; $165/$185

Inn at Children's
731-4700; $99/$109

Lafayette Hotel
451-2600; $160/$180

Lenox Hotel
536-5300; $115/$165

Logan Airport Hilton
569-9300; $135/$155

Marriott Long Wharf
227-0800; $215/$235

Meridien
451-1900; $185/$205

Midtown Hotel
262-1000; $99/$109

Omni Parker House
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Park Plaza
426-2000; $120/$140

Ritz Carlton
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Royal Sonesta
491-3600; $140/$140

Sheraton Boston
236-2000; $135/$155

Sheraton Tara Braintree
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Tremont House
426-1400; $110/$125

Westin Copley
262-9600; $170/$190

All phone numbers are 617 area code. Rooms are priced for single and double occupancy.

MACWORLD EXPOSITION

* All conference sessions are on a first-come, first-served basis with no guaranteed seating.

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PRODUCT UPDATES

Product	V.	Req.	Rev.	Price
MacEnvelope Plus	2.0	512KE/3.2		$50
Macintosh Yellow Pages	1.1	1MB/6.0		*
MacFalcon	2.1	1MB/6.0.3		*
MacFlow ★	3.1.5	1MB/6.0.3		Free
MacFortran	2.4	512K/4.2		*
MacFortran/020	2.4	512K/4.2		*
MacFortran for MPW	1.1	2MB/6.0.2		Free
MacInUse	3.0	1MB/6.0		$30
MacLinkPlus/PC	4.5	1MB/6.0.2		*
MacLinkPlus/Wang VS	4.0	512KE/3.2		$45
MacLotto	2.1	512K/4.0		$10
MacMainFrame 3270/CUT	2.1	2.5MB/6.0.2		$100
MacMoney	3.5	512KE/4.0		$12
MacPhonebook	3.0	1MB/6.0		*
MacProject II	2.1	1MB/6.0		Free
MacProof ★	3.2.1	1MB/6.0.2		$30
MacRascol	2.0	2MB/4.1		$25
MacRecorder	2.0	512K/3.2		*
MacroMind Director	2.0	2MB/6.0.2	10/90	$100
MacSafe II		512KE/4.2	10/90	*
MacSchedule	2.0	1MB/6.0		$30
MacSmarts	4.0	1MB/6.0		*
MacTerminal	3.0	512K/3.2		$65
MacWrite II	1.1	1MB/6.0		Free
Managing Your Money	4.0	1MB/6.0.3		*
MapGrafix	2.0	4MB/6.0.3		Free
Maple	4.2.1	1MB/6.0		*
MarcoPolo	1.1	1MB/6.0		Free
MarketMaster	II+	1MB/6.0.3		$25
MarkUp	1.02	1MB/6.0		Free
Master Tracks Pro 4	4.12	1MB/4.1		$45
MathCAD ★	2.06	1MB/6.0.2		Free
Mathematica	2.0	1MB/6.0		*
MathType	2.1	512K/6.0.2		*
Matlab	1.2	1MB/3.0		*
MaxPage ★	1.2	512K/3.2		Free
McClint	2.0	1MB/4.2		$25
McCPrint	2.1	512K/4.2		$25
McMax	2.0	1MB/5.0		*
Metronomefont	1.5	1MB/6.0		$5
MGMStation ★	2.5	512KE/3.0		*
MicroPhone II	3.0	512K/4.2	7/90	*
Microsoft Excel	3.0	1MB/6.0.2		*
Microsoft File	2.0	512K/3.2		*
Microsoft Mail	3.0	1MB/6.0.2		*
Microsoft PowerPoint	2.01	1MB/6.0		Free
Microsoft Word	4.0	512KE/3.2		*
Microsoft Works	2.0	512K/6.0		*
MindWrite ★	2.1	512KE/4.2		*
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MockPackage Plus Utilities	4.4	512KE/3.2		$15
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MultiClip	2.0	512K/6.0.2	8/90	*
MultiLedger ★	1.1	512K/3.2		Free
MusicProse	2.2	1MB/6.0		Free
Music Publisher	2.5	1MB/6.0		*
MyDiskLabeler III		1MB/6.0		$25
M.Y.D.B.	2.0	1MB/6.0		*
MyTimeManager	2.0	1MB/6.0		*
Nemesis Go Master	4.0	512K/4.1		*
NetMinder Ethernet	1.2	2MB/6.0		*
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The NightWatch ★	1.03	512KE/3.2		*

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Nisus	3.04	1MB/6.0.2	2/91	Free
Now Utilities	2.0.3	1MB/6.0.2	8/90	*
NuPaint H	1.04	512K/3.2		Free
NuTools	1.2	1MB/6.0		*
Nutrition Stack	2.0	1MB/6.0.2		$20
OmniPage ★	2.1	1MB/6.0.2		Free
Omnis 3 Plus/Express	2.0	512KE/3.2		*
On Schedule	2.0	1MB/3.0		*
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PacerLink	5.0	512K/5.0		*
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The Phrase Thesaurus	2.0	1MB/6.0		Free
PICT Detective	2.0	512KE/6.0		$20
PixelPaint	2.1	2MB/4.1		*
PixelPaint Pro	2.0	3MB/6.0.3		$125
Plains & Simple ★	1.06	1MB/3.2		*
PostShow	1.1	1MB/6.0		$35
PowerDraw	3.0	1MB/6.0		*
PowerStation ★	2.5.2	512K/4.1		Free
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Practice Musica	2.1	512K/3.2		$10
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Pro-Cite ★	1.3	512K/4.1		*
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The Programmer's Online Companion	2.0	1MB/6.0.2		$10
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Publish It Easy	2.0	1MB/6.0	9/90	*
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Pyro	4.0	512K/4.1	7/90	$15
Q-Sheet A/V	2.0	1MB/6.0	10/90	$50
QuarkXPress	3.0	2MB/6.0.5	11/90	$30
Quicken ★	1.5	512K/3.2		*
QuicKeys²	2.0.1	1MB/6.0.2	1/91	$49.95
QuickLetter	1.1.2	1MB/6.0		$30
QuickLock	2.0	512KE/3.2	10/90	Free
QuickMail	2.5	512KE/3.2		*
QuickShare	2.0	512KE/3.2		$75
QuickShot ★	2.1	1MB/4.2		$5
RagTime 3	3.04	2MB/6.0	8/90	$150
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SAM	2.0	1MB/6.0	2/91	$29.95
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SmartScrap & The Clipper	2.0	1MB/6.0.3		$20
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Spelling Coach Professional	3.1	512KE/4.2		*
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SuperGlue II with GlueNotes	2.1	1MB/6.0		*
SuperLaserSpool	2.0.2	1MB/6.0		$30
SuperPaint	2.0	1MB/6.0.2		$50
SuperSpool	5.0	512K/4.1		$30
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Tempo+ Tools ★	1.1	1MB/4.2		*
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Wingz ★	1.1	1MB/6.0		Free
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WordPerfect for the Macintosh	2.0	1MB/4.2		*
WorksPlus Command	2.0	2MB/6.0.3		$35
WorksPlus Spell	2.0	1MB/6.0.3		$35
WriteNow	2.2	512K/4.2	9/90	$49

To have products listed in this section, send upgraded software, an outline of changes since the previous release (indicate if it's a maintenance upgrade), upgrade price, minimum RAM and system software, suggested retail price, company name, mailing address, and phone number to *Updates, Macworld,* 501 Second St., San Francisco, CA 94107

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Accu-Scan Intra-Cut Machining; 503/632-3330; fax 503/632-6462.

Advanced Security Advanced Gravis Computer Tech.; 604/434-7274; fax 604/434-7809.

Agfa Focus Color Scanner Agfa Compugraphic Division; 508/658-5600, 800/822-5524.

Anchor Pad Anchor Pad International; 805/658-2661, 800/350-0200; fax 805/658-6432.

Apple MIDI Interface Apple Computer; 408/996-1010.

AVR 3000/CL Plus AVR; 408/434-1115, 800/544-6243; fax 408/434-0968.

Beyond Dr. T's Music Software; 617/455-1454; fax 617/455-1460.

CABLE KITS

Doss Industries 415/861-2223, 800/766-5625.

Kensington Microware 415/572-2700, 800/535-4242; fax 415/572-9675.

Secure-It 413/525-7039, 800/451-7592.

Camouflage usrEZ Software; 206/672-5387; fax 206/778-7146.

Casio Electronic Musical Keyboards Casio Electronic Musical Instruments Division; 201/361-5400; fax 201/361-3819.

ChromaScan Sharp Electronics Corp.; 201/529-9500, 800/237-4277; fax 201/529-9454.

CIS•3515 Barneyscan Corp.; 415/521-3388, 800/933-0330; fax 415/521-9780.

ClickChange Dubl-Click Software; 818/700-9525, 800/359-9079; fax 818/700-9727.

CMO-1 MicroNet Technology; 714/837-6033; fax 714/837-1164.

ColorGetter Optronics; 508/256-4511; fax 508/256-1872.

Colorizer Palomar Software; 619/721-7000; fax 619/721-4758.

The Complete Half-Page Scanner/400 The Complete PC; 408/434-0145, 800/634-5558; fax 408/434-1048.

ConcertWare+MIDI Great Wave Software; 408/438-1990; fax 408/438-7171.

DataPak MO Mass Microsystems; 408/522-1200, 800/522-7979; fax 408/733-5499.

DeluxeRecorder Electronic Arts; 415/571-7171, 800/245-4525.

Descartes Intermap; 603/795-4751; fax 603/795-4226.

Disinfectant John Norstad; Academic Computing & Network Services, Northwestern University, 2129 Sheridan Rd., Evanston, IL 60208; America Online: JNorstad; AppleLink: A0173; CompuServe: 76666,573; Internet: jln@casbah.acns.nwu.edu.

DiskLock Fifth Generation Systems; 504/291-7221, 800/873-4384; fax 504/295-3268.

DS-3000 Color Scanner Chinon America; 213/533-0274, 800/441-0222; fax 213/533-1727.

Eikonix 1435 Slide Scanner Ektron Applied Imaging; 617/275-0475, 800/735-8766; fax 617/271-1997.

Empower I, Empower II Magna; 408/433-5467; fax 408/943-0651.

Encore Passport Designs; 415/726-0280; fax 415/726-2254.

Erasable MO Plus Relax Technology; 415/471-6112; fax 415/471-6267.

Erasable MO Vista Relax Technology; 415/471-6112; fax 415/471-6267.

ES-300C Epson America; 213/782-0770, 800/289-3776.

Expert Backgammon Komodo Software; 415/949-2039; fax 415/949-4825.

EZ Vision Opcode Systems; 415/369-8131; fax 415/369-1747.

FileGuard ASD Software; 714/624-2594; fax 714/624-9574.

Finale Coda Music Software; 612/854-1288, 800/843-2066; fax 612/854-4631.

FolderBolt Kent Marsh; 713/623-8618, 800/325-3587; fax 713/961-5747.

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GuardCard Kent Marsh; 713/623-8618, 800/325-3587; fax 713/961-5747.

hammerDisk600S FWB; 415/474-8055; fax 415/775-2125.

Hard Disk Deadbolt, Hard Disk Partition FWB; 415/474-8055; fax 415/775-2125.

HyperMusic Passport Designs; 415/726-0280; fax 415/726-2254.

Infinity Optical PLI; 415/657-2211, 800/288-8754.

Inspire Alphatronix; 919/544-0001, 800/229-8686.

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Instant Library of Quotations Nova Development Corp.; 818/992-3222, 800/950-6682; fax 818/702-9571.

JX-100M Sharp Electronics Corp.; 201/529-9500, 800/237-4277; fax 201/529-9454.

JX-300 Sharp Electronics Corp.; 201/529-9500, 800/237-4277; fax 201/529-9454.

JX-450 Sharp Electronics Corp.; 201/529-9500, 800/237-4277; fax 201/529-9454.

JX-600 Sharp Electronics Corp.; 201/529-9500, 800/237-4277; fax 201/529-9454.

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Kawai Personal Keyboards Kawai America; 213/631-1771, 800/421-2177; fax 213/604-6913.

Kodak 35mm Rapid Film Scanner Eastman Kodak; 716/724-4000.

Korg M1 Music Workstation Korg USA; 516/333-9100.

Kurzweil 1000 Series Keyboards Kurzweil Music Systems, a product line of Young Chang America; 213/926-3200; fax 213/404-0748.

La Cie 600 Magneto Optical La Cie; 503/691-0771, 800/999-0143.

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LS-3500 Film Scanner Nikon; 516/547-4200, 800/645-6687.

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MacSPIRS SilverPlatter Information; 617/969-2332, 800/343-0064; fax 617/969-5554.

MacTools Deluxe Central Point Software; 503/690-8090, 800/445-2110, fax 503/690-8083.

Magic 600 Optical, Magic 600 Optical ISO MacProducts USA; 512/343-9560,

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Microtech OR650 Microtech International; 203/468-6223, 800/626-4276.

Microtek MSF-300ZS Microtek; 213/321-2121, 800/654-4160.

MidiFace EX Altech Systems; 318/868-8036; fax 318/868-7402.

MidiFace LC Altech Systems; 318/868-8036; fax 318/868-7402.

MIDI Hits Music Data, Division of Passport Designs; 415/726-0280.

MIDI Interface Passport Designs; 415/726-0280; fax 415/726-2254.

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MIDI Time Piece Mark of the Unicorn; 617/576-2760.

MIDI Translator Opcode Systems; 415/369-8131; fax 415/369-1747.

MockPackage Plus Utilities CE Software; 515/224-1995,800/523-7638; fax 515/224-4534.

MultiDisk ALSoft; 713/353-4090; fax 713/353-9868.

MusicProse Coda Music Software; 612/854-1288, 800/843-2066; fax 612/854-4631.

MyScan Howard and Associates; 805/492-4842; fax 805/492-9973.

NetModem V.32 Shiva Corp.; 617/252-6300, 800/458-3550; fax 617/252-6852.

NetModem V2400 Shiva Corp.; 617/252-6300, 800/458-3550; fax 617/252-6852.

NightWatch Kent Marsh; 713/623-8618, 800/325-3587, fax 713/961-5747.

The Norton Utilities for the Macintosh Symantec; 408/253-9600, 800/441-7234, fax 408/252-4694

OmniMedia 3c, OmniMedia 3cx XRS; 213/214-1900; fax 213/214-1474.

Omnistor Computer Upgrade Corp.; 714/630-3457, 800/874-8807; fax 714/630-9254.

One-Step Freq Sound; 301/964-3548.

Optirase Conversion Dynamics; 205/991-8338, 800/752-7058; fax 205/991-8358.

OptiServer 600 Deltaic Systems; 408/441-1240, 800/574-1240; fax 408/437-1719.

Padolock Doss Industries; 415/861-2223, 800/766-5625.

PassProof Kensington Microware; 415/572-2700, 800/535-4242; fax 415/572-9675.

Peacock Cyan; 509/238-6789.

Performer Mark of the Unicorn; 617/576-2760.

Personal Color Scanner Howtek; 603/882-5200, 800/444-6983; fax 603/880-3843.

Personal FileLock Verge Technologies; 804/543-9608; fax 804/545-4202.

Personality Preferred Publishers; 901/683-3383; fax 901/683-4983.

PhoneNet Liaison Farallon Computing; 415/596-9100; fax 415/596-9020.

Phovos 400C Prime Option; 213/618-0274, 800/282-9877; fax 213/618-1982.

Pioneer Multi function optical disk drive Relax Technology; 415/471-6112; fax 415/471-6267.

Pro 4 Passport Designs; 415/726-0280; fax 415/726-2254.

Protector Shark Ibis Software; 415/546-1917; fax 415/543-0346.

Pyro Fifth Generation Systems; 504/291-7221, 800/873-4384; fax 504/295-3268.

QCS-35 Imapro Corp.; 613/738-3000; fax 613/738-5038.

QCS-120 Imapro Corp.; 613/738-3000; fax 613/738-5038.

QCS-450i Imapro Corp.; 613/738-3000; fax 613/738-5038.

QCS-600 Imapro Corp.; 613/738-3000; fax 613/738-5038.

QuicKeys² CE Software; 515/224-1995, 800/523-7638; fax 515/224-4534.

QuickLock Kent Marsh; 713/623-8618, 800/325-3587; fax 713/961-5747.

Quotemaster Plus/Mac PennComp Software; 713/669-0965, 800/326-6145; fax 713/669-1014.

REO-130 Pinnacle Micro; 714/727-3300, 800/553-7070; fax 714/727-1913.

REO-650 Pinnacle Micro; 714/727-3300, 800/553-7070; fax 714/727-1913.

REO-6500 Pinnacle Micro; 714/727-3300, 800/553-7070; fax 714/727-1913.

REO-36000 Pinnacle Micro; 714/727-3300, 800/553-7070; fax 714/727-1913.

ResEdit APDA-Apple Computer; 800/282-2732; fax 408/562-3971.

Resorcerer Mathemaesthetics; 617/738-8803.

Rhapsody Green Oak Software; 619/434-0823; fax 619/755-8348.

RM600 Mirror Technologies; 612/633-4450, 800/654-5294; fax 612/633-3136.

Roland S-770 Digital Sampler Roland Corp. US; 213/685-5141; fax 213/722-0911.

SAM Symantec Corp.; 408/253-9600, 800/441-7234; fax 408/252-4694.

SampleCell Digidesign; 415/688-0600, 800/333-2137; fax 415/327-0777.

SB-SMO-1 MicroNet Technology; 714/837-6033; fax 714/837-1164.

SC-7500 Mitsubishi International; 914/997-4999; fax 914/997-4976.

Scan 300/Color Abaton, a Subsidiary of Everex Systems; 415/683-2226, 800/444-5321.

Scan:Align American Business Concepts; 214/904-9121; fax 214/904-9121.

ScanMaker 1850S Microtek; 213/321-2121, 800/654-4160.

ScanMan Model 32 Logitech; 415/795-8500, 800/231-7717; fax 415/792-8901.

Scanmaster 3 Howtek; 603/882-5200, 800/444-6983; fax 603/880-3843.

Screen Locker Now Software; 503/274-2800, 800/237-3611; fax 503/274-0670.

ScriptEdit Somak Software; 619/942-2556, 800/842-5020; fax 619/632-9087.

SecureInit Direct Software; 415/347-1590; fax 415/347-7991.

Sentinel 2.2 SuperMac Technology; 408/245-2202; fax 408/735-7250.

Silverscanner La Cie; 503/691-0771, 800/999-0143.

SimEarth Maxis Software; 415/254-9700, 800/336-2947; fax 415/253-3734.

SP-200 Wacom; 201/265-4226, 800/922-6613; fax 201/265-4722.

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SP-300 Wacom; 201/265-4226, 800/922-6613; fax 201/265-4722.

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Page No.	Advertiser	Reader Svc. No.	Phone
64	Abacus	50	800/666-STAT
13	Abaton	43	800/444-5321
242	AbraMacDabra	54	—
65	Advanced Vision Research	47	—
40	AEC Software	83	—
34	Aldus	—	—
220	Altsys	35	214/680-2060
8	Anthro	—	800/325-3841
266-267	APS	—	800/233-7550
228	Ark International	49	800/232-6221
199	Articulate Systems	74	800/443-7077
224	Aura Systems	120	800/365-AURA
264	Aurora Systems	18	800/426-1591
206	Berkeley Systems Design	381	415/540-5535
265	Bottomline	—	900/420-3636
68	Caere Corp.	103	800/535-SCAN
77	Caere Corp.	1	800/535-SCAN
263	Cambridge Computer (ERI Direct)	19	800/535-3252
194-195	Canon USA	164	—
32	Casady & Greene, Inc	137	408/624-8716
32	Casady & Greene, Inc	134	408/624-8716
98	Claris	—	800/544-8554
208	CompuServe	319	800/848-8199
235	Computer Associates	10	—
187	Contemporary Cybernetics	188	804/873-0900
22	Curtis Manufacturing	20	603/532-4123
200	Dantz Development	259	415/846-0293
230	DCA MacIRMAtrac	71	—
27	Deneba Software	346	800/6CANVAS
29	Deneba Software	57	800/6CANVAS
19	Design CAD, Inc	336	918/825-4848
19	Design CAD, Inc	337	918/825-4848
287	Digital Technology	75	801/226-2984
263	Diskette Connection	79	800/654-4058
252-253	Dr. Mac, Inc	368	800/825-6227
67-67	E-Machines	303	800/34GRAPH
192	Eastman Kodak	377	800/344-0006
238	Ehman, Inc	2	800/257-1666
14-15	Ehman, Inc	144	800/257-1666
12	Engineered Software	12	—
247	ERI Direct	184	800/535-3252
205	Fifth Generation Systems	364	800/873-4384
211	Fifth Generation Systems	73	800/873-4384
30-31	Frame Technology	60	—
16	Generation Systems	170	800/325-5811
89	Genstar Rental Electronics	—	800/422-3300
287	GeoQuery	4	800/541-0181
110	Golden Triangle	99	—
78	Graphsoft	46	301/461-9488
40	Griffin Computer	110	
255	Hard Drives International	—	800/776-DISK
244B	IDG Books	—	—
73	Image Club	—	403/262-8008
201	Image Club	—	403/262-8008
102	Insignia Solutions	72	—
104	International Business Software	221	800/733-2822
74-75	Jasmine	126	800/347-3228
BC	Kensington Microware	255	415-572-2700
33	Key Tronic	289	800/262-6006
24-25	La Cie	199	800/999-0143
202	La Cie	52	800/999-0143
90	La Cie	195	800/999-0143
236	LaserMaster	342	612/944-9696
183	Linotype-Hell	97	—
286	LRO Computer Sales	—	800/869-3152
289	Mac and More	85	600/MAC-0052
80-88	Mac Zone, The	70	800/248-0800
210-217	Mac's Place	209	800/367-4222
96-97	MacAcademy	168	800/527-1914
95	MacAcademy	106	800/527-1914
256-257	MacCenter	—	800/950-3726
42-61	MacConnection	—	800/334-4444
209	MacFriends	109	800/622-8804
223	MacFriends	58	800/622-8804
233	MacFriends	270	800/622-8804
188	Macintosh Masters IV	—	—
260-261	MacLand	264	800/333-3353
262	MacProducts USA	175	800/622-3475
258	MacSource	48	—
254	MacTel Technology	142	800/950-8411
112-121	MacWarehouse	240	800/455-9677
180B-181B	Macworld Expo	—	—
239-241	Macworld Expo Boston '91	—	—
232A	Mass Micro Systems	207	800/522-7973
288	Media '92	—	—
76	Microcom	41	617/551-1021
287	Micromac	92	
174	Microsoft	—	800/541-1261
161	Microsoft	—	800/541-1261
IFC-1	Microsoft	—	800/541-1261
218	Microsoft	—	800/541-1261
225	Microtech International	80	800-325-1895
229	Microtek Labs	63	—
C3-C5	Mirror Technologies	125	800/654-5294
181W	Mobius	89	800/669-0556
106-107	NEC Technologies	314	800/NEC-INFO
222	NEC Technologies	66	800/NEC-INFO
79	New Era	77	305/255-5586
173	Ocean Microsystems	33	—
178	OCLI	374	800/545-OCLI
176	ON Technology	13	617/876-0900
12	Outbound Systems	30	—
244N	Pacer Software	91	—
197	Paragon Concepts	253	800/922-2993
185	Peachtree Software	100	800/247-3224
227	Periperal Vision	98	—
100	Pinnacle Micro	266	800/553-7070
94	Portfolio Systems	198	914/876-7744
64	Quantum Leap	82	305-446-2477
20-21	QuarkXPress	65	800/356-9363
39	QuarkXPress	295	800/356-9363
6-7	Radius	178	800/227-2795
5	RagTime USA	102	415/780-1800
108	RasterOps	15	800/468-7600
72	Reference Software	14	800/872-9933
36	Salient	39	415/321-5375
38	Secure-It	239	800/451-7592
38	Secure-It	86	—
26	Sensible Software	396	313/528-1950
9	Shiva Corp	—	800/458-3550
70-71	SoftSync/ BLOC Publishing	367	800/993-2537
28	Software Security	95	—
180W	Spectrum Holobyte	—	415-522-0107
48	Sterling Solutions	81	800/247-9712
191	Storage Dimensions	127	408/879-0300
191	Storage Dimensions	176	408/879-0300
198	Strata Inc.	93	800/869-6855
62	Supermac	88	—
37	Symantec	96	—
41	Systat	29	708/864-5670
41	Systat	172	708/864-5670
4	T B S P	25	800/755-8277
207	Tektronix	143	800/835-6100
196	Teleware	76	—
92-93	Texas Instruments	313	800/527-3500
259	Thirdwave	114	800/284-0486
204	Total Systems	26	800/874-2288
10-11	Wordperfect	—	800/526-5034
171	Xante	—	—

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1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230
231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290
291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330
331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380
381	382	383	384	385	386	387	388	389	390
391	392	393	394	395	396	397	398	399	400

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Free Catalog Info

401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470
471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520
521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570
571	572	573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588	589	590
591	592	593	594	595	596	597	598	599	600

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11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230
231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290
291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330
331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380
381	382	383	384	385	386	387	388	389	390
391	392	393	394	395	396	397	398	399	400

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Free Catalog Info

401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470
471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520
521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570
571	572	573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588	589	590
591	592	593	594	595	596	597	598	599	600

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Page No.	Advertiser	Reader Svc. No.
SOFTWARE		
	BUSINESS	
64	Abacus	50
242	AbraMacDabra	54
40	AEC Software	83
34	Aldus	—
68	Caere Corp	103
77	Caere Corp	1
98	Claris	—
235	Computer Associates	10
30-31	Frame Technology	60
287	GeoQuery	4
174	Microsoft	—
161	Microsoft	—
IFC-1	Microsoft	—
218	Microsoft	—
176	ON Technology	13
185	Peachtree Software	100
94	Portfolio Systems	198
72	Reference Software	14
38	Secure-It	239
38	Secure-It	86
70-71	SoftSync/BLOC Publishing	367
41	Systat	29
41	Systat	172
4	TBSP	25
196	Teleware	76
	VERTICAL	
64	Abacus	50
242	AbraMacDabra	54
70-71	SoftSync/BLOC Publishing	367
4	TBSP	25
	DATA MANAGEMENT	
287	GeoQuery	4
	WORD PROCESSING	
197	Paragon Concepts	253
26	Sensible Software	396
10-11	Wordperfect	—
	CAD/CAM	
19	Design CAD Inc	336
19	Design CAD, Inc	337
12	Engineered Software	12
78	Graphsoft	46
	COMMUNICATION	
230	DCA MacIRMAtrac	71
104	International Business Software	221
100	Pinnacle Micro	266
	EDUCATIONAL	
95	MacAcademy	106
96-97	MacAcademy	168
	FONTS	
32	Casady & Greene, Inc	134
73	Image Club	—
201	Image Club	—
	GRAPHICS/DTP	
34	Aldus	—
220	Altsys	35
32	Casady & Greene, Inc	134
98	Claris	—
27	Deneba Software	346
29	Deneba Software	57
30-31	Frame Technology	60
73	Image Club	—
201	Image Club	—
20-21	QuarkXPress	65
39	QuarkXPress	295
198	Strata Inc	93
62	Supermac	88
	ENTERTIANMENT	
180W	Spectrum Holobyte	—
	NETWORKING	
230	DCA MacIRMAtrac	71
287	Digital Technology	75
102	Insignia Solutions	72
76	Microcom	41
12	Outbound Systems	30
244N	Pacer Software	91
9	Shiva Corp	—
	SECURITY	
32	Casady & Greene Inc	137
37	Symantec	96
206	Berkeley Systems Design	381
200	Dantz Development	259
205	Fifth Generation Systems	364
211	Fifth Generation Systems	73
76	Microcom	41
176	ON	13
36	Salient	39
38	Secure-It	239
38	Secure-it	86
37	Symantec	96
	UTILITIES	
68	Caere Corp.	103
77	Caere Corp.	1
64	Quantum Leap	82
HARDWARE		
	COMPUTER SYSTEMS	
263	Cambridge Computer (ERI Direct)	19
247	ERI Direct	184
89	Genstar Rental Electronics	—
209	MacFriends	109
223	MacFriends	58
233	MacFriends	270
287	Micromac	92
	PRINTERS	
13	Abaton	43
192	Eastman Kodak	377
236	LaserMaster	342
183	Linotype-Hell	97
289	Mac and More	85
229	Microtek Labs	63
106-107	NEC Technologies	314
222	NEC Technologies	66
207	Tektronix	143
92-93	Texas Instruments	313
	BOARDS	
16	Generation Systems	170
110	Golden Triangle	99
286	LRO Computer Sales	—
108	RasterOps	15
204	Total Systems	26
	DIGITIZERS/SCANNERS	
65	Advanced Vision Research	47
90	La Cie	195
	DISPLAY	
224	Aura Systems	120
66-67	E-Machines	303
238	Ehman, Inc	2
14-15	Ehman, Inc	144
202	La Cie	52
287	Micromac	92
181	Mobius	89
6-7	Radius	178
	MODEMS	
9	Shiva Corp.	—
	HARD DRIVES/STORAGE	
187	Contemporary Cybernetics	188
14-15	Ehman, Inc	144
205	Fifth Generation Systems	364
211	Fifth Generation Systems	73
110	Golden Triangle	99
40	Griffin Computer	110
74-75	Jasmine	126
24-25	La Cie	199
232	Mass MicroSystems	207
225	Microtech International	80
C3-C5	Mirror Technologies	125
173	Ocean Microsystems	33
227	Peripheral Vision	98
100	Pinnacle Micro	266
48	Sterling Solutions	81
191	Storage Dimensions	127
191	Storage Dimensions	176
	VIDEO	
194-195	Canon USA	164
108	RasterOps	15
	EXPANSIONS/UPGRADES	
224	Aura Systems	120
286	LRO Computer Sales	—
204	Total Systems	26
171	Xante	—
	SOFTWARE SECURITY	
28	Software Security	95
	INPUT DEVICES	
199	Articulate Systems	74
22	Curtis Manufacturing	20
33	KeyTronic	289
	MISCELLANEOUS	
287	Digital Technology	75
89	Genstar Rental Electronics	—
178	OCLI	374
SERVICES		
	ON-LINE	
208	CompuServe	319
	TRAINING	
96-97	MacAcademy	168
ACCESSORIES		
	FURNITURE	
8	Anthro	—
	MISCELLANEOUS	
228	Ark International	49
BC	Kensington Microware	255
178	OCLI	374
MAIL ORDER		
266-267	APS	—
264	Aurora Systems	18
263	Cambridge Computer (ERI Direct)	19
258	MacSource	48
254	MacTel Technology	142
79	New Era	77
265	Bottomline	—
263	Diskette Connection	79
252-253	Dr. Mac, Inc	368
247	ERI Direct	184
255	Hard Drives International	—
80-88	Mac Zone, The	70
210-217	Mac's Place	209
256-257	MacCenter	—
42-61	MacConnection	—
209	MacFriends	109
223	MacFriends	58
233	MacFriends	270
260-261	MacLand	264
262	MacProducts USA	175
112-121	MacWarehouse	240
259	Thirdwave	114

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Software

ABRACADATA
- Design your own Home Landscape, Architecture or Interiors 58

ADOBE SYSTEMS
- Adobe Illustrator 3 0 with ATM 348
- Adobe Type Manager. 62
- Adobe TypeSet 1 or 2 62
- Adobe Type Align 65
- StreamLine 2 0 112
- Photoshop 535
- Entire Font library available ..... CALL
- Type On Call 58

ANDROMEDA
- Master Tuner 55



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- Pagemaker. 489
- Freehand 2.0 388
- Persuasion. 319

ALADIN
- Shortcut 1.5 45
- Stuffit Deluxe 2.0 62

ASD
- FileGuard 2.5 137

ASHLAR
- AshlarVellum 599

ASHTON TATE
- FullWrite 135
- Full Impact 135

AVERY
- MacLabelPro 47
- Labels Available ..... CALL

BRODERBUND
- TypeStyler 117

CAERE
- OmniPage 499
- Typist 469

CARAVELLE
- Mac To Mac (Special 10 pak price) 210

CERES
- Inspiration 115

CE SOFTWARE
- Quickmail 10 User 298
- QuicKeys 94
- DiskTop 4.0 64

CLARIS
- MacWrite II 139
- FileMaker Pro 209
- MacDraw II 275
- ClarisCad 625
- SmartForm Designer 279



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- DeltaGraph 105
- Taste 75

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DYNAWARE
- DynaPerspective 3D 599

FARALLON
- Media Tracks 185
- Timbuktu 92
- Timbuktu Remote 2.0 122
- Timbuktu 3.1 30 Pack 1275

FISHER
- Idea Fisher 422

FRANKLIN SOFTWARE
- Language Master 57



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- White Knight 81

HAYES
- SmartCom II v3.2 82

HYPERPRESS
- PictureLink 199

ICOM SIMULATIONS
- On Cue 34
- TMON 85
- HyperTMON 56

INNOVATIVE DATA DESIGN
- Dreams 1.1 399
- MacDraft 2.1 299

INSIGHT DEVELOPMENT
- MacPrint 89

INSIGNIA
- Soft PC 242

INT'L BUSINESS SOFTWARE
- Dataclub - 3 user pack 175
- Dataclub 10 Pack 499

LANGUAGE SYSTEMS
- Fortran with MPW 398
- Wild Things 119

LEXPERTISE
- MacProof 104

MACROMIND
- Macromind Director 625
- Accelerator 125

MAGNA
- Empower I 119
- Empower II 142

MAINSTAY
- MacFlow 3.5 168

MANAPRO
- General Ledger 480

MECA
- Managing Your Money 128

MICROCOM
- Carbon Copy Mac 115
- Virex 59
- Virex 10 Pack 345

MICROFRONTIER
- Enhance 199

MICROLYTICS
- Inside Information 59
- Gofer 52
- Wordfinder 34

MICROSOFT
- Word 4.0 248
- Excel 248
- Help for Excel with Excel purchase . 25
- Power Point 248
- Microsoft Office 565

MULTI-AD SERVICES
- Multi-Ad Creator 449
- Multi-Ad Search 108



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- ScreenLocker 43
- Now Utilities 74

ODESTA CORPORATION
- Double Helix 365
- Data Desk 465

OLDUVAI
- Videopaint 199

ON TECHNOLOGY
- On Location 71

OPCODE
- EZ Vision 98

PARACOMP
- Model Shop 369
- Filmaker 429
- Swivel 3D Professional 429

PARAGON
- Nisus 238



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- Exposure Pro 65
- Personality! 49

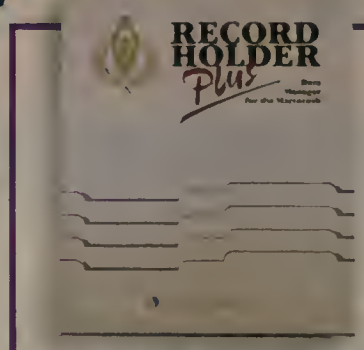
PRE-PRESS TECHNOLOGIES
- SpectreSeps—Quark/Pagemaker . 225
- SpectreScan 325

QMS
- UltraScript 99

QUARK
- QuarkXPress 519

REALITY TECHNOLOGIES
- WealthBuilder 142

SALIENT
- DiskDoubler 42



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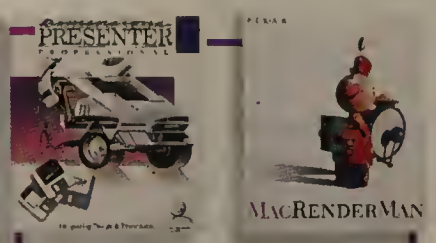
SERIUS CORP.
- Serius Programmer 194
- Serius Developer 324

SITKA
- Network Bundle for MAC 185

SOFTVIEW
- if:X Forms Designer 164
- Business Expense Reports 47
- MacInTax 56
- Personal Tax Analyst 46
- Quarterly Payroll Tax 84
- 13 States available ..... CALL

SOFTWARE DISCOVERIES
- RecordHolder Plus 78

SOLUTIONS INTERNATIONAL
- Smartscrap 52
- SuperGlue II 66
- The Curator 69



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- StrataVision 3D 348
- StrataVision 3D/MacRenderman . 1085

STUDIOTRONICS
- Colorset 169

SUPERMAC
- Pixel Paint Professional 385
- Pixel Paint 226

SYMANTEC
- Norton Utilities 86
- SAM 65
- SUM II 104
- Think C 4.0 159

SYMMETRY
- Key Plan 225
- Mariah 79

SYSTEMS COMPATIBILITY
- Software Bridge 75

TACTIC SOFTWARE
- Magic Typist 39
- Icon It! 39
- Sound Clips 39
- ArtClips 39
- ArtFonts 39
- FontShare 125

TIMEWORKS
- Publish it! Mac 219
- Publish it! Mac Easy 2.0 142

T-MAKER
- Write Now. 115
- ClickArt ..... From 33

VERTICAL SOLUTIONS
- FastLabel 79
- FastEnvelope 39

VISUAL INFO DEVELOPMENT
- PresenterPro & MacRenderman . 3445

WORDPERFECT CORP.
- WordPerfect 269

ZEDCOR
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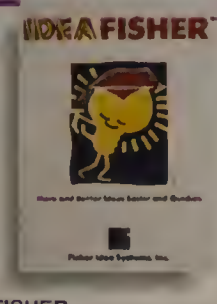
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- Voice Link 179

ATTO TECHNOLOGY
- Mac IIci Cache Card 239

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- The Typist 469

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- Ether Plus 398
- Ether II 318

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- Toner ZipKit 34



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- MacTilt 59

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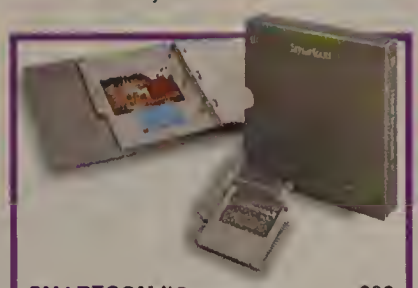
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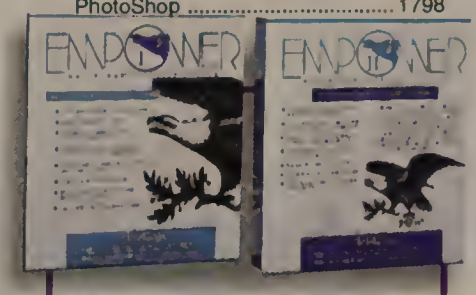
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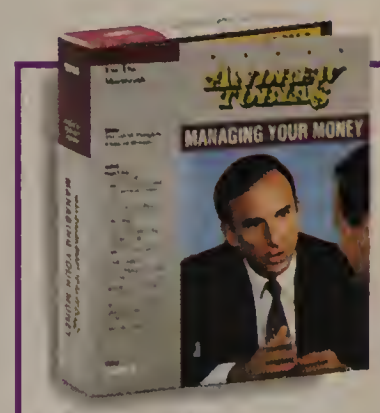
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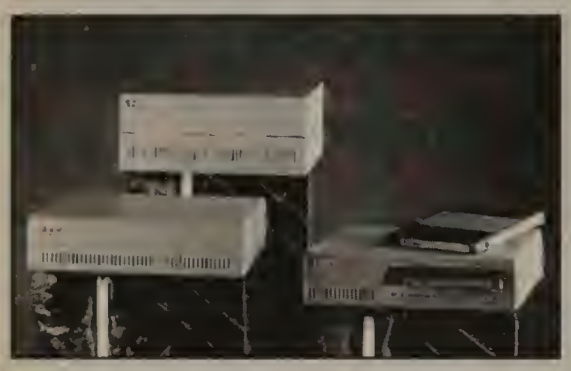
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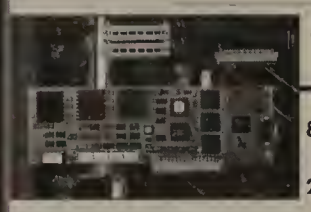
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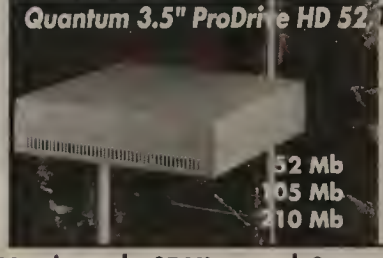
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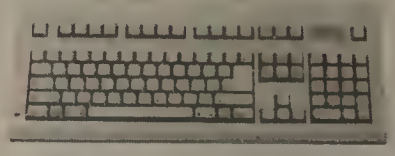
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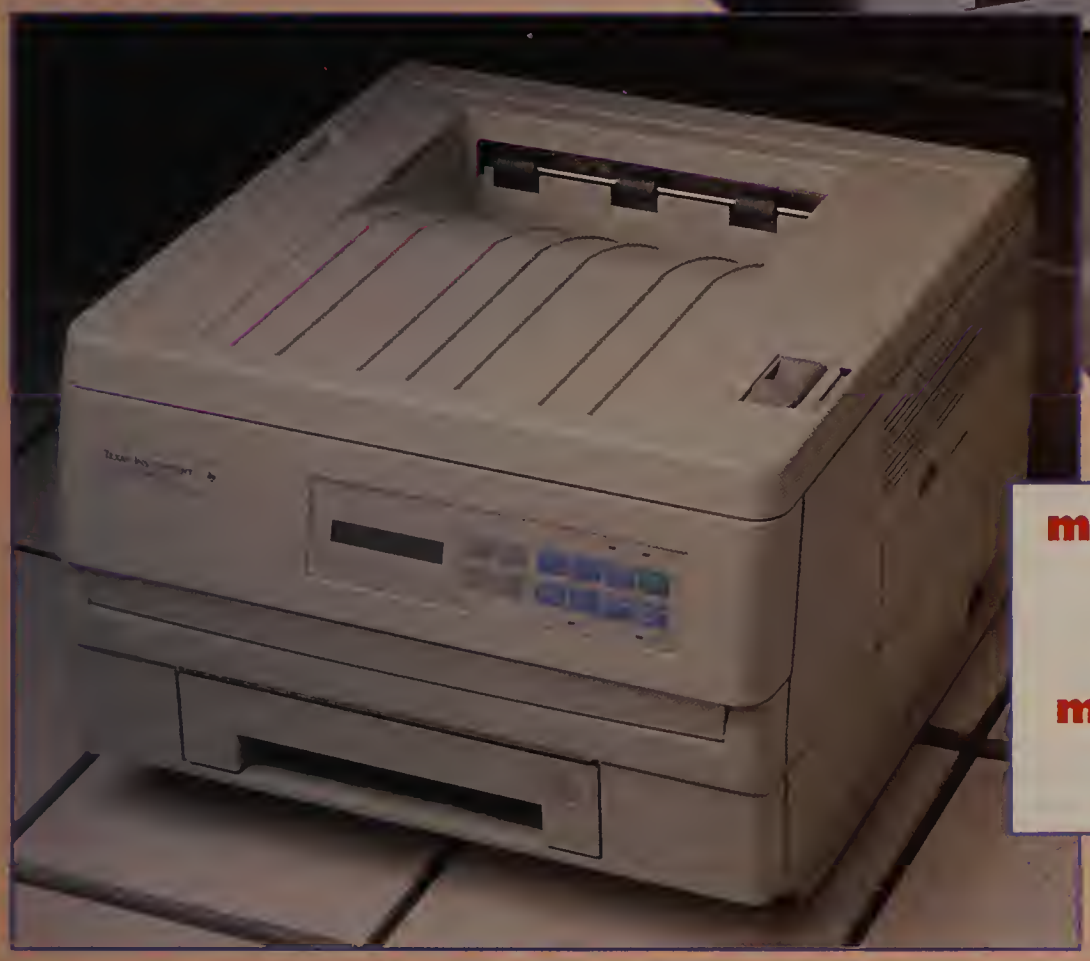


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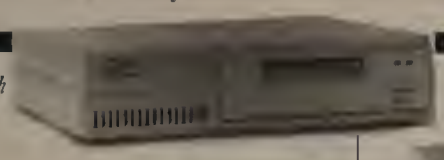
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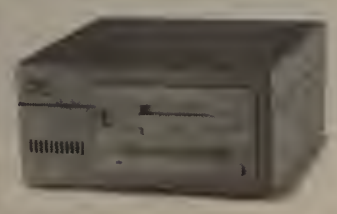
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45R SyQuest, one cart	$559
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120	(Quantum)	679	809
170	(Quantum)	749	879
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600	1729	1899
650	1999	2169
1000	2799	2969



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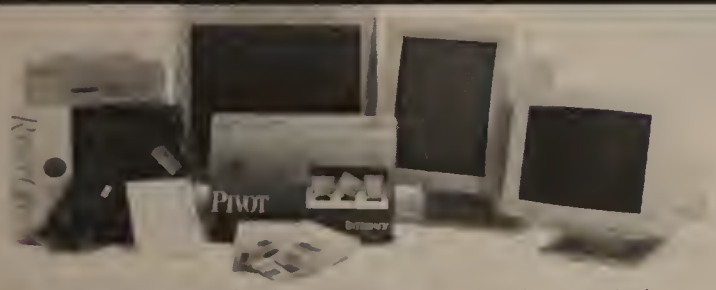
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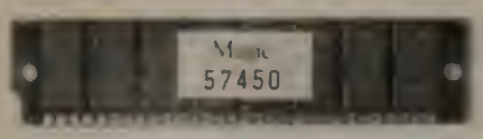
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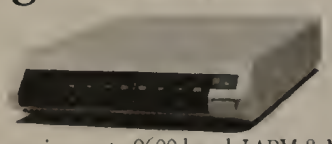
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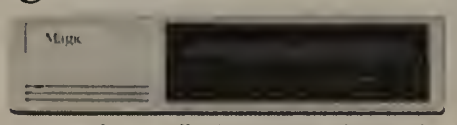


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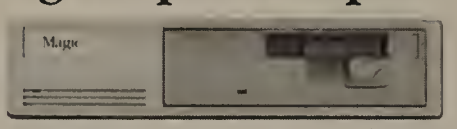
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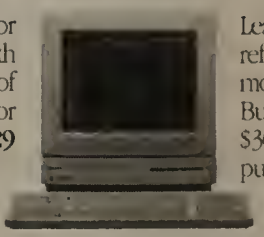
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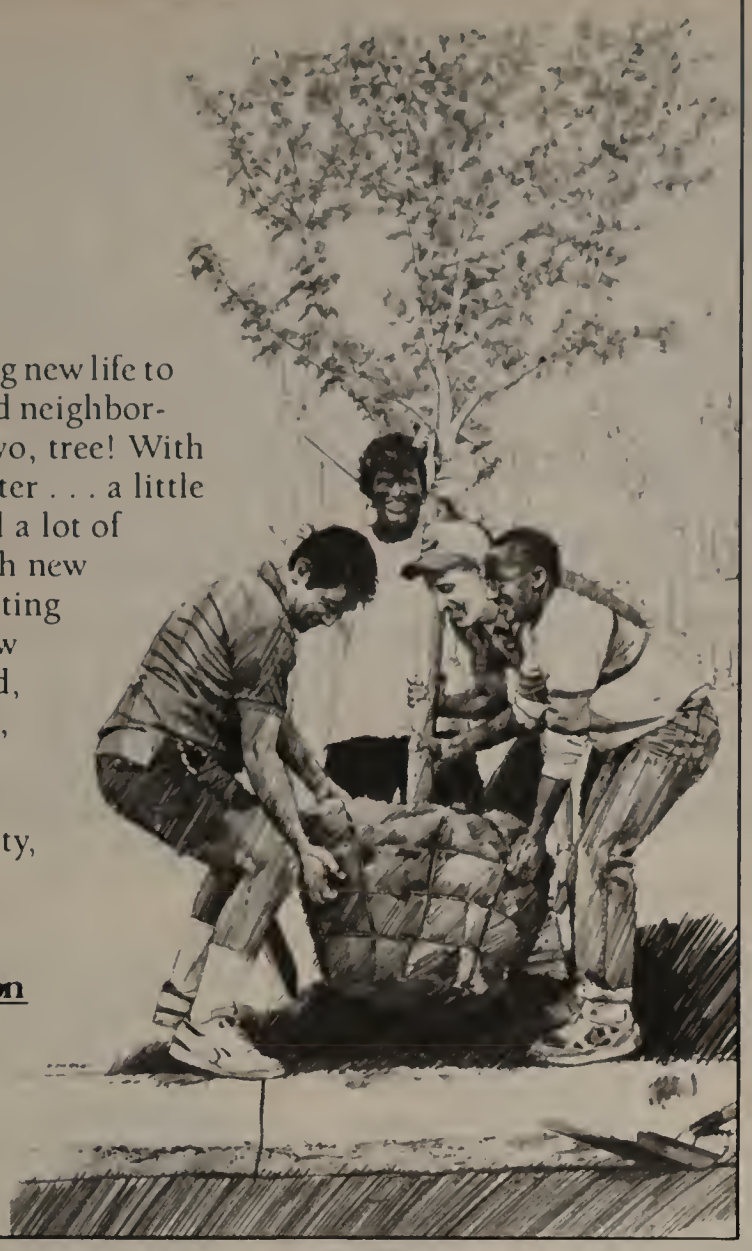
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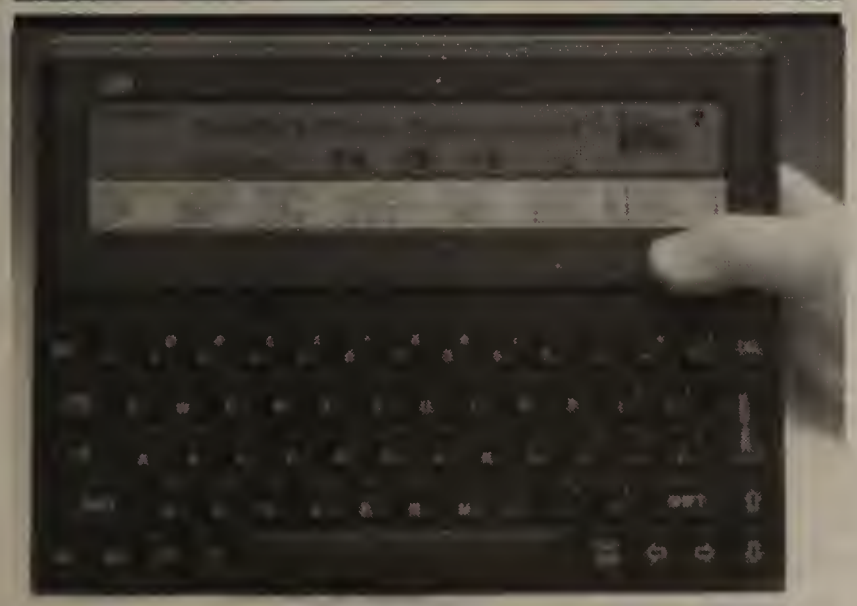
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4. Service: Absolutely the best in the industry! If we tell you we have it, WE DO! We'll ship your drive when we promise, as we promise. We never charge your credit card until after your order has shipped from our factory. In the unlikely event that you have a problem with your drive, our exclusive "30 day performance guarantee" goes immediately into effect. We'll ship you a new drive over night* and have the suspect drive picked up at our expense. After the first 30 days, our warranty turn-around time is 48 hours (often 24). We'll Ship back to you via overnight air* - our expense. Our one and two year warranties include a thirty day money-back guarantee. Your toll-free phone call to either sales or technical support is answered by a real person 24 hours a day, none of those frustrating voice mail mazes that you find other places. Our goal is to care for you better and faster than the dealer down the street.

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105LPS	499	589
120	639	729
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210	799	889

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- Quantum & Maxtor 200 Internal Drives fit Mac II/IIX/SE/SE30/Cx/Ci/Fx
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- WREN Internal Drives fit Mac II/IIX/IIFx

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The Macworld Catalog

Hardware

Bar Code 269
Computer Systems 269
Emulators 271
Magnetic Media 272
Monitors 273
Memory Upgrade 273
Peripherals 274
Printers 275

Software

Architecture 275
Astrology 276
Bar Code 276
Business 276
CAD/CAM 276
Clip Art 276
CD/ROM 277
Data Base 277
Educational 277
Entertainment 278
Engineering 278
Fonts 278
Genealogy 279
Graphics 279
Graphics Translators 279
HyperCard Stacks 279
Import/Export 279
Inventory Control 279
Languages 279
Lottery 280
Medical 280
Multimedia 280
Music/MIDI 280
Nutrition 281
Programming Tools 281
Property Management 281
Public Domain 281
Real Estate 281
Religion 282
Restaurant 282
Sales/Marketing 282
Scientific 282
Sign Making 282
Statistics 282
Training 282

Services

Computer Insurance 282
Computer Repair 282
Data Conversion 283
Desktop Publishing 283
Laser Recharge 283
Multimedia 283
Repair 284

Accessories

Furniture 284
Mouse Pads 284
Supplies 284
Diskettes 285

The Macworld Catalog Advertising Rates & Information

The Macworld Catalog section is a monthly link-up for advertisers and volume purchasers of Macintosh-related products and services. The Catalog offers advertisers a low-cost marketing opportunity and provides readers with a timely, easy-to-use menu for product buying.

Display ads are sold by column inches (2" minimum). Standard red is available as a second color. Text-only listings are available for a minimum of three issues at $520 per issue.

For more information on *The Macworld Catalog*, call 800/888-8622.

The Macworld Catalog Advertising Sales Staff

Beverly Schneider, Telemarketing Sales Manager
Niki Stranz, Western Account Manager, 415/978-3105
Carol Felde, Eastern Account Manager, 415/978-3152

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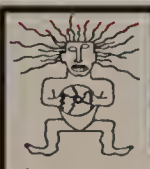
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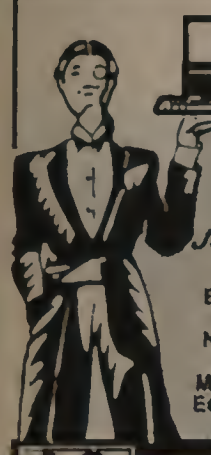
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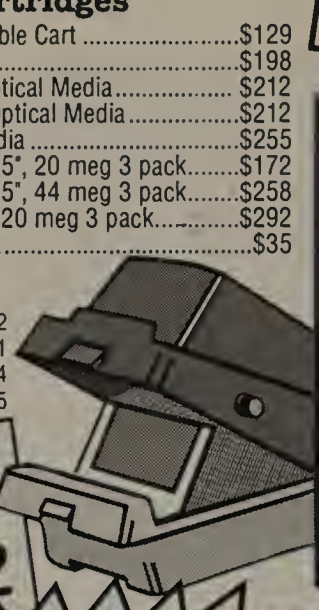
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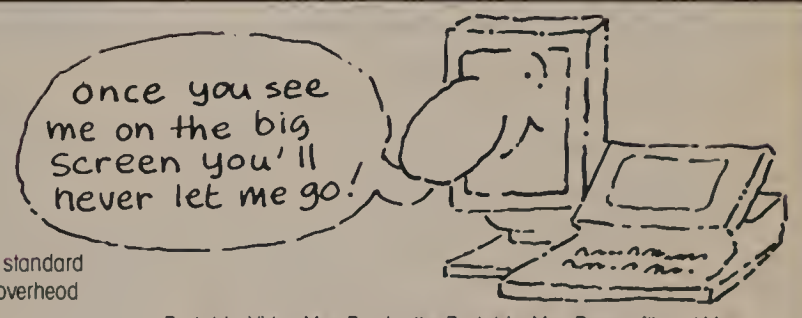


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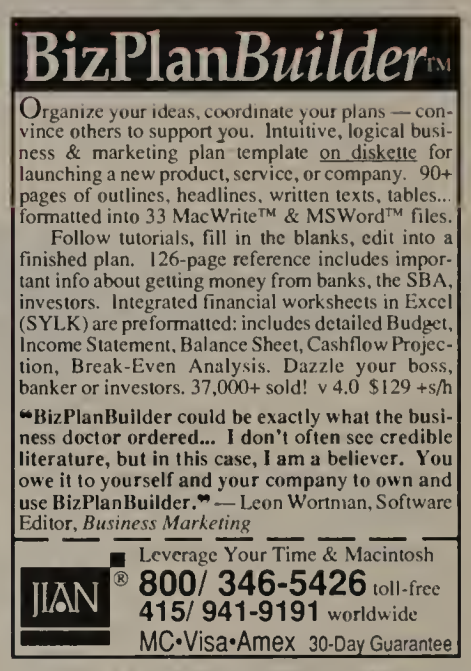
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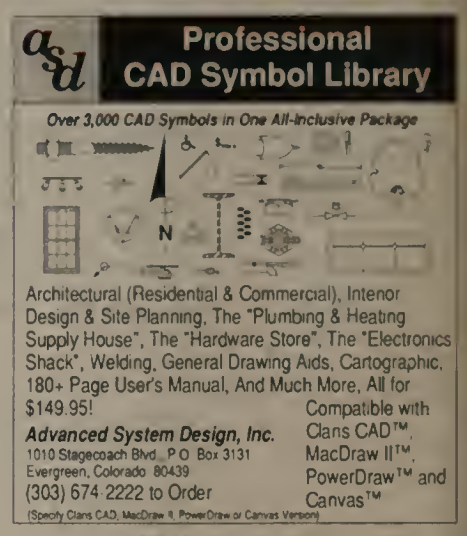
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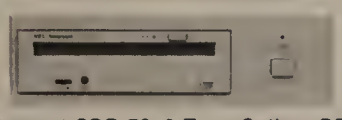
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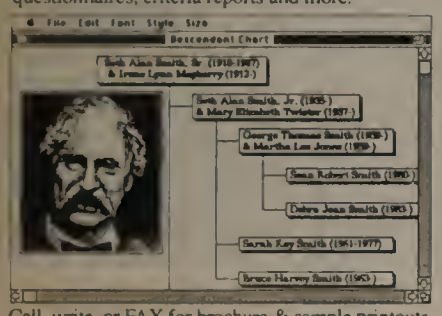
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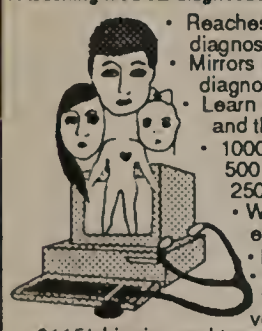
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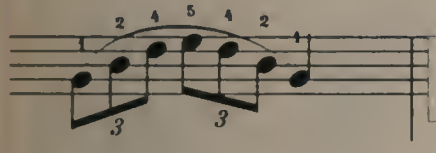
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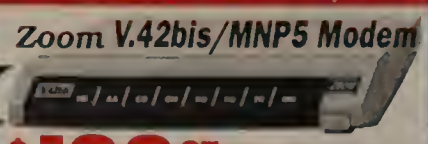
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52	2	2	**Microsoft Works**	Microsoft Corporation
64	3	3	**Microsoft Excel**	Microsoft Corporation
60	4	4	**Aldus PageMaker**	Aldus Corporation
25	5	5	**FileMaker Pro**	Claris Corporation
49	6	6	**MacWrite II**	Claris Corporation
26	7	7	**QuarkXPress**	Quark
12	8	8	**Quicken**	Intuit
20	9	9	**Adobe Illustrator**	Adobe Systems
25	—	10	**WordPerfect**	WordPerfect Corporation

EDUCATION SOFTWARE

27	1	1	**Where in the World Is Carmen Sandiego?**	Broderbund Software
8	2	2	**Where in Time Is Carmen Sandiego?**	Broderbund Software
40	3	3	**Reader Rabbit**	The Learning Company
14	4	4	**Where in the USA Is Carmen Sandiego?**	Broderbund Software
53	5	5	**Math Blaster**	Davidson & Associates

ENTERTAINMENT SOFTWARE

18	1	1	**SimCity**	Maxis
16	2	2	**Tetris**	Spectrum HoloByte
3	3	3	**SimEarth**	Maxis
26	5	4	**Falcon**	Spectrum HoloByte
10	4	5	**Welltris**	Spectrum HoloByte

NETWORK/DATA COMMUNICATIONS

52	1	1	**TOPS**	Sitka Corporation
47	2	2	**AppleShare**	Apple Computer
9	4	3	**Timbuktu**	Farallon Computing
6	5	4	**White Knight**	FreeSoft
11	—	5	**MacLink Plus**	DataViz

MASS STORAGE*

16	1	1	**MacStack SD40**	CMS Enhancements
3	4	2	**MacStack SD45**	CMS Enhancements
31	5	3	**MacStack SD20**	CMS Enhancements
1	—	4	**Collegiate Pack Transportable Hard Drive**	MicroNet Technology
4	3	5	**UltraDrive 45**	GCCTechnologies

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7	2	1	**Macintosh Display Card 8•24**	Apple Computer
9	4	2	**Radius TPD Interface**	Radius
8	1	3	**Pivot**	Radius
2	3	4	**Macintosh IIsi NuBus Adapter Card**	Apple Computer
8	—	5	**ColorBoard 264**	RasterOps Corporation

UTILITY SOFTWARE

14	1	1	**SAM II**	Symantec Corporation
14	3	2	**SUM II**	Symantec Corporation
8	2	3	**The Norton Utilities for the Macintosh**	Symantec Corporation
1	—	4	**After Dark**	Berkeley Systems
13	4	5	**Adobe Type Manager**	Adobe Systems

PRODUCT WATCH

Recent or forthcoming products of particular interest.

Soft F/X *Digital F/X*
Software for digitizing video input without peripherals

Radius Rocket *Radius*
Speedy NuBus accelerator board for color graphics

Digital Film *SuperMac Technology*
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Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order vendors. Covers sales during February 1991.

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595Mb	*$1797*	*N/A*
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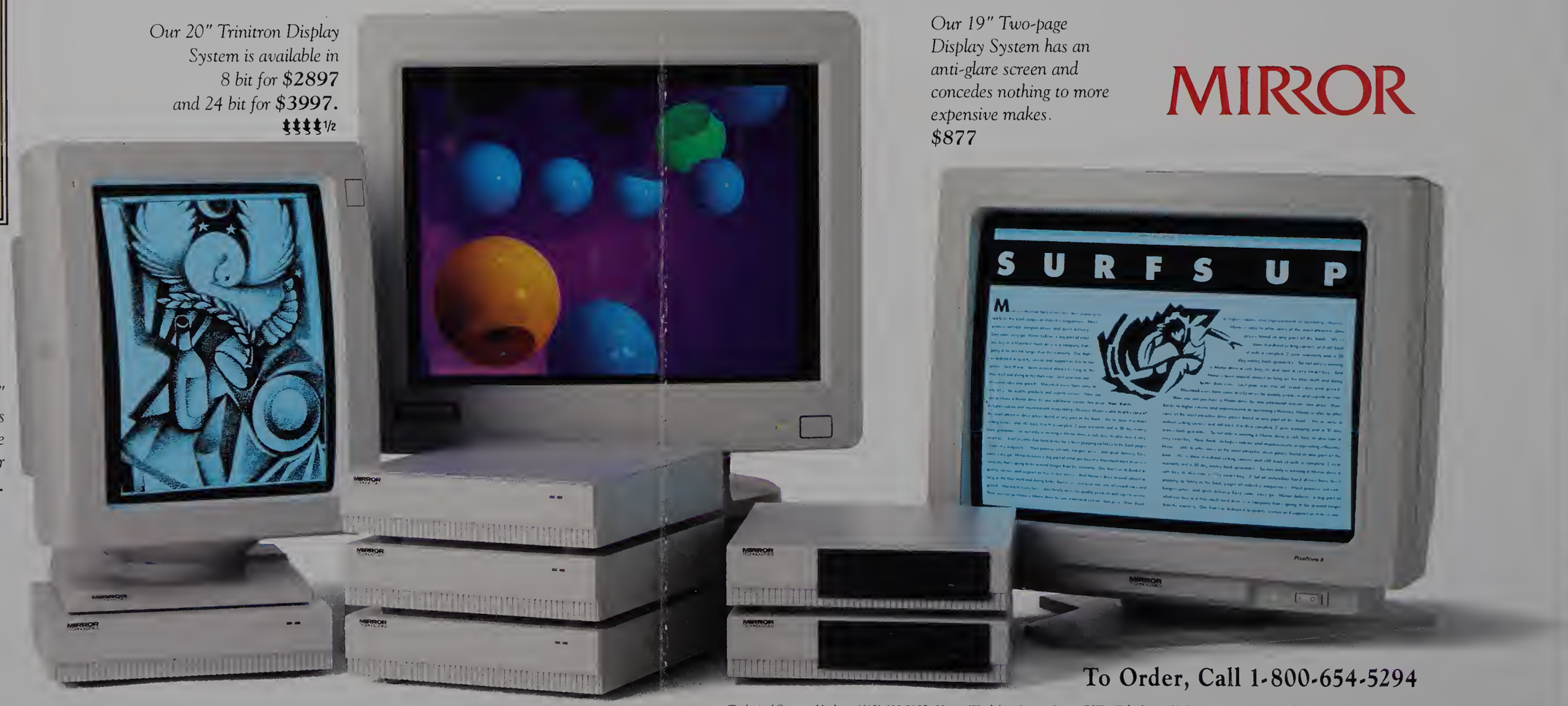
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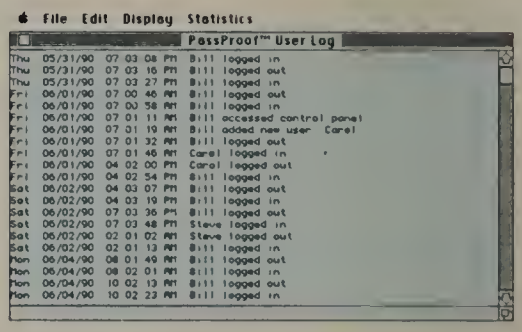


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